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How to Grow Better Strawberries

By J. L. Baskin

Tennessee State Horticultural Society, Inc.

THE STRAWBERRY is the most widely cultivated of the small fruits, being grown to some extent in every state in the Union. It is heralded far and wide as the greatest dessert delicacy one could wish. To mention strawberries arouses the thirst of the palate, and a whiff of the pleasant aroma from the freshly picked fruit excites the appetite. It is little wonder that this king of the small fruits is so widely grown.

Cultivated Less Than 100 Years

We find no mention of the strawberry growing in the Garden of Eden along with the apple and fig. It was not until the middle of the nineteenth century that the strawberry was considered a cultivated fruit. In 1835, Hovey introduced a seedling that was a very great improvement and gave rise to the growing of the strawberry as a cultivated fruit. The introduction of the Wilson in 1854 was the triumph of the age and enabled everybody to have strawberries in the back yard garden. It was the introduction of the Wilson that put strawberry growing "on the map," so to speak, and since then the improvements in varieties and cultural practices have been phenomenal.

Zones of Production

Although the strawberry is grown from Florida to Maine, and from California to Delaware, the principal zones of production are along the Atlantic Coast in the states of New Jersey, Delaware and Maryland. Other areas of concentration are to be found in the eastern Carolinas and central Florida. More recently there has developed heavy producing areas in Louisiana, Missouri, Arkansas, Tennessee and western Kentucky. In many of the states above mentioned, the production amounts to upward of 3000 cars per season. This heavy production is limited only by the unwillingness of the public to pay a fair margin of profit above costs. There is little doubt that these favored centers could and would produce twice as many berries as they are now growing should the public demand such an increase.

Soil and Climate Factors

The strawberry is adaptable to a wide variety of soils and climates. It can be grown in tropical Florida as well as in Canada and Maine. It will grow on coarse gravel as well as on heavy clays. But successful commercial growing is confined to rather definite areas in spite of its wide adaptability.

The strawberry, like other plants, has its choice as to soil and climate. It thrives best on a soil that warms up readily in the spring, and which is rich in humus and retentive of moisture. It is true that strawberries are frequently grown on the heavier types of clay, but growers invariably prefer loamy soils where they are available, even though they are not so rich in plant food. The very nature of the succulent, meaty plant requires that it have an abundant supply of moisture near at hand. The top soil is the primary factor in soil requirements since the fibrous roots of the berry seldom reach the clay. The berry requires a well-drained soil, although it thrives well on acid soils and will not thrive on a soil strongly alkaline. The subsoil is valuable, however, as a moisture reservoir.

Although the strawberry does equally as well in the lowlands of Louisiana as it does on the ridges of the Ozarks, we find that in both areas the plants grow and bear during the early spring season before the summer heat arrives. The strawberry is a cool weather plant and will not stand the intensive heat of midsummer. This is why Florida and Louisiana growers plant their fields in the fall, secure a full crop the next year, then destroy the fields. The long summer heat of these states devitalizes the crowns to such an extent that it is not profitable to use the field a second year. In the Ozarks, the fields are set in the spring and it is not until the second growing season that a full crop is secured. Fields last from two to three seasons in the Missouri, Arkansas and Tennessee areas.

A 20-acre field of Aromas growing in new ground on gravelly slopes of east Tennessee

Both the grade and pack must be satisfactory to pass federal shipping point inspectors

Time of Setting

The time of setting new fields varies in different localities, but generally speaking, in the more southern areas the new plants are set closely in the row in the early fall, with the expectation of a full crop the following spring. In these warmer climates during the fall season, if it is normal in rainfall and not too hot, the plants will develop a satisfactory matted row of well-formed crowns. Further north, fall set plants stand a good chance of being heaved out by the freezes, and should this not occur, the fall season is so short that the plants would not make sufficient growth to bear a full crop the following year. It is, therefore, easy to understand why spring setting is the custom.

Systems of Growing

Whether fall or spring planted, most commercial fields are grown under what is generally known as the matted row system. The original plants are spaced in rows 30 to 36 inches apart. The plants send out stolons and form a thick matted row about 12 to 14 inches wide. Such a system gives an excellent bearing surface, whether the grower chooses to cultivate or mulch between the rows. After the matted row is formed and the plants become dormant, they should never be cultivated the following spring. To do so excites vegetative action on the part of the plant, which is not conducive to the proper development of the fruiting spurs. The fleshy crowns of the strawberry plant store up plant food within the tissues during the growing season, and after the rest period a patch should not be heavily fertilized or cultivated. Heavy fertilizing may cause the entire field to turn from fruiting into a mass of new plants.

Fertilizing

The fact that certain varieties of strawberries, when planted in rich gardens, all go to vine has given rise to the belief that strawberries do not require a rich soil. Some varieties have more of a tendency to go to vine than others. Those producing heavy foliage and sending out many stolons will require less nitrogen than those that

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Handling the Orchard Soil

Part III—The Fertilizing Program

By J. H. Gourley
Ohio Agricultural Experiment Station

IN THE two preceding articles of this series, I have attempted to point out the effects of various cultural practices upon the soil itself and upon the tree growth. In the present and last article, I will treat more particularly the fertilizing program.

Neither space nor inclination will allow a discussion of the interesting history of this matter in America, but it is sufficient to say that there has been a radical change in notions regarding the use of manures and chemical fertilizers in the orchard. These changes have not come about without sharp controversies, and even today there is not a uniform opinion in regard to all the essentials of orchard fertilization among either professional horticulturists or orchardists. And yet certain points do stand out as obvious, and the large amount of work in progress by the experiment stations of the country will result in more facts on which all can unite in establishing our future practices.

Figure 1.—These Stayman Winesap trees have been grown without fertilizer

Fruit Trees An Exception to the Rule

Fruit trees stand in a class by themselves so far as fertilization is concerned. While no one rule holds for other crops, yet it is a very significant fact that no other crop gives its maximum response on most soils from continuous treatments with nitrogen alone. Most others over a period of time will give the greatest returns from a complete fertilizer, that is, from some combination of nitrogen, phosphorus and potash, either supplied from the fertilizer bag or a part supplied from manure, cover crops, or some other source. The students of soils have continuously maintained that sooner or later on practically every soil fruit trees will require a complete fertilizer also, for it is well known that they utilize considerable quantities of all the essential elements, just as farm crops do. With this idea we would not disagree, but when that time arrives, the fact should be revealed in the many experiments that are under way throughout the fruit belt of the country.

For the past couple of years or more, we have encountered a strong trend in certain quarters to emphasize the need at the present time of a complete fertilizer for all fruits and the disaster that is imminent if the use of nitrogen alone is continued in the orchard and vineyard. Theory would seem to favor such a view, but practice has failed so far to confirm it. There is need for comprehensive observations along this line, however. Particularly is it claimed that fruit keeps poorer when treated with nitrogen only. The writer has some Stayman Winesap apples in common storage at the present time from unfertilized trees, from trees receiving a normal application of nitrogen and from trees that have received five times the normal amount for the past several years. Final results are not yet available, but there is no outstanding difference between the lots at this time, all having kept well (April 19).

Another instance that may be cited is that of some Elberta peaches that were grown with different amounts of nitrogen, with a complete fertilizer, and without any treatment. In 1925, bushel lots from the nitrogen-potash, light manure, and untreated plots were shipped by express to Prof. Blake in New Jersey, and he made observations on them periodically for a month and reported that all samples kept remarkably well, drying up rather than decaying. The total decayed specimens were 11 each from the high nitrogen plot and light manure plot and 21 from the untreated one. In 1926, samples of all plots were shipped from the Lake Erie region where they were grown to Wooster and records made. The first did not keep so well as the year previous, nearly all of it eventually showing decay. There was no measurable difference between the different lots, however. Until this question has been fully answered, more comprehensive work of this nature is needed. If nitrogenous fertilizers in such quantities as are usually recommended were to reduce the keeping quality of the fruit, then remedial measures must be taken.

Fertilizers in the Tilled and Non-Tilled Orchards

Elsewhere I have pointed out that one of the common sources of error and misunderstanding in orchard fertilization has been a failure to distinguish between orchards that are tilled and those that are in sod. The very fact that the land is cultivated and that cover crops are plowed into the soil usually means that nitrogen in available form for plants is likely to be abundant (although not always) and that additional amounts supplied in chemical fertilizers are practically lost so far as tree growth or cropping is concerned. On the other hand, as we have seen in the previous articles, sod reduces nitrification and utilizes a portion of that which is produced so that nitrogen fertilization at once supplies a serious deficiency and marked results may be seen within a few weeks after its application. In other words, it depends on the starting point as to whether or not a response is to be expected. Why should we engage in controversies when in reality we are discussing two different sets of conditions?

These remarks refer to apple orchards only, for it is well known that peach, cherry and plum orchards that are in tillage usually make a striking response to nitrogenous fertilizers.

Carriers of Nitrogen

Before considering other phases of the problem, let us consider briefly the relative merits of the different carriers of nitrogen. We doubt if sufficient evidence is yet at hand to form a final opinion on this matter, but such as is available is useful, and there is not a great deal of controversy on this point. The two outstanding materials at the present time are nitrate of soda and sulphate of ammonia, both of them quickly available forms. Each has its adherents, and special merits are claimed for each. The work of the Ohio station, which comprises experiments in apple orchards in several counties and in two peach orchards, indicates that there is little difference in the returns secured from equal quantities of actual nitrogen used. In one apple orchard, nitrate of soda produced the greater yield and in another sulphate of ammonia appeared superior. In the others, as well as in the peach orchards, no differences are apparent, both materials giving equally good results.

The claim that sulphate of ammonia is so slowly available as to fail to give the early stimulus needed in fruit setting, to result in late maturity of fruit and trees, or to produce an injurious acid reaction of the soil, has not found any support in our work. These results are pretty largely supported elsewhere, except in Maryland, where superior results were obtained from the nitrate when it was first used on a neglected orchard.

Organic forms of fertilizer, such as dried blood, tankage and bone meal, are occasionally recommended, but the experiments show them to be less effective and more expensive than those mentioned above.

Cyanamid is a synthetic nitrogen that has been on the market for some years. In the writer's work with the peach, this material has given good results, but it scarcely equals the other forms of nitrogen, although the work has not progressed sufficiently to permit final conclusions. Illinois reports that this material produced smaller and lighter colored leaves on the apple than nitrate and sulphate, although the fertilized plots produced better leaves than the check trees.

Calcium nitrate is a newer form that is attracting attention, partly because the claim is made that it leaves a calcium residue. It is a synthetic product and, we understand, is likely to appear on our markets in large quantities. The Illinois results with it appear to be about the same as from nitrate of soda.

Animal manures form a source of fertilizing material that was formerly abundant and rather cheap. Where it is still available in sufficient quantity, it makes an excellent fertilizer for the orchard, particularly where it can be plowed into the land. But when it is applied as a surface dressing beneath the trees, it will not give as quick or as efficient results as the quickly available forms of chemicals.

All of this raises the question of whether American orchardists can continue indefinitely to maintain soil fertility by means of cover crops and chemical fertilizers, or whether animal manures are necessary, at least a part of the time. Our own opinion is that the orchard industry would face a dark future if it were necessary to obtain sufficient manure to adequately fertilize the trees even a portion of the time. A ton of manure contains about 10 to 13 pounds of total nitrogen, and a ton of nitrate of soda contains about 300 pounds of nitrogen. A ton of manure would be sufficient for about 10 to 15 trees, and a ton of nitrate of soda will treat about 250 mature trees, allowing eight pounds per tree, which is a liberal application. Thus, the mechanical problem of distributing enough manure to be the equivalent of an equal treatment of the concentrated chemicals is a serious problem in itself. And over a period of nearly 20 years chemicals and cover crops have been successfully used in the great majority of commercial orchards, which is at least a hopeful sign in the face of the manure shortage.

Figure 2.—These Stayman trees, which are of the same age as those shown in Figure 1, have been heavily fertilized each year

Time of Application

The usual time of applying fertilizers to fruit trees throughout the East, particularly the nitrogen, is during a two or three-week period prior to blossoming. While this is probably

(*Continued on page 20*)

Rambles of a Horticulturist

By C. E. Durst

AS STATED in the May issue, the writer recently accompanied a party of agricultural editors through Louisiana, Texas and old Mexico. The trip was arranged by the officers of the American Agricultural Editors' Association in co-operation with the Missouri Pacific and Mexican National railways. There were about 70 persons in the party, all told. We started from St. Louis March 20 on a special train fitted out by the Missouri Pacific Railway, consisting of Pullmans, diner and baggage car. The Pullmans enabled us to save much time by traveling at night, and the diner proved a great help to us in Mexico, for while good Mexican food could have been obtained, it would be too much of a change to expect anyone to make suddenly, especially during a busy trip.

Our train left St. Louis in the evening, headed south along the west bank of the Mississippi. In the morning, we were slipping through the great rich valleys and lowlands of Arkansas and Louisiana, a large portion of which are no doubt flooded at this writing. Cotton and corn and truck crops were just getting well started. According to reports, these crops were all delayed in growth, due to wet, cool weather.

First Stop at Baton Rouge

Our first stop was made at Baton Rouge, the capital of Louisiana. It is located on the east bank of the Mississippi on the first rise of land found above the gulf. It is therefore free from flood damage. It is also at the head of deep water navigation, and large ocean steamers ply the river to this point. Due to the width of the Mississippi, our train was ferried across on a barge.

The most interesting feature at Baton Rouge from our standpoint was the new state university. Not long ago a new tract of 2174 acres was purchased about two miles south of the city. A finely arranged campus has been laid out. A wonderfully attractive and serviceable group of buildings, constructed of brick and brown stucco, has been built. The university is now in operation, although freshmen and sophomore girls are still being taken care of in the buildings on the old grounds just north of the city. In connection with the university, there is a large tract of land used for farm and experimental purposes. The agricultural group consists of three main buildings and an auditorium, costing about $500,000, including equipment. The people of Louisiana deserve great credit for their support of agriculture. Their college has accomplished important work in the past, but it will no doubt accomplish greater things in the future.

Baton Rouge is also extremely interesting from a commercial standpoint. Many new industrial and transportation enterprises are being developed. The Standard Oil Company, for instance, is spending $28,000,000 in the construction of a new oil tank field. Real estate is in strong demand, and prices are said to be high.

New Orleans Is Great Port

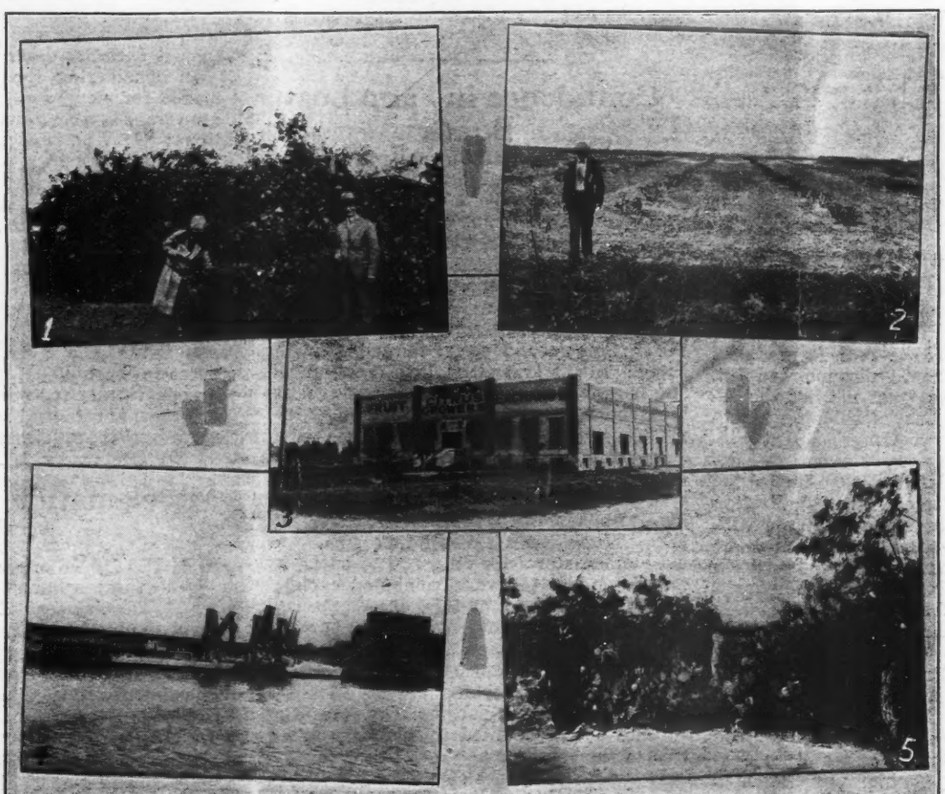
We next visited New Orleans. Perhaps the most interesting thing about this city is the harbor. The river is wide and deep here, and the harbor is of great size. There are seven miles of wharves, warehouses, elevators and sheds, and three miles more of railroad and private warehouses, dry docks, etc. There were boats in the harbor from all parts of the world. This port is second in the United States in tonnage handled. In imports handled, it is exceeded only by New York, and in exports it is exceeded by New York and Galveston. It is the world's greatest banana, sisal and mahogany port. In 1926, 22,000,000 bunches of bananas were unloaded.

After taking a long ride about the harbor in a fire boat, our party visited a banana unloading warehouse. Most of the party stated that they wanted to see how the bananas were handled, but after getting into the warehouse, it seems that practically all of them lost interest in studying the methods of operation and began to concentrate on eating ripe bananas. The bananas are unloaded by means of great booms which are lowered into the holds of the ship. A bunch is placed in each canvas pocket of the endless chain and is thus carried to the interior of the warehouse. The bunches are here taken from the belt and carried to the cars. Bananas are at no time placed in refrigerator cars or boats, as refrigeration causes the development of scald and rot.

We spent a few hours looking over New Orleans. This wonderfully interesting city was founded in 1718 and is full of historical buildings and landmarks. In the museums, there are many war relics and other things of great interest. The population is now about 425,000, about one-fourth of which is negroes. Most of the city is beneath the level of the Mississippi River, and the salvation of the town depends on the security of the great levees that practically surround it on all sides.

A Change in Climate

Leaving New Orleans in the evening, we found ourselves in Houston, Texas, the next morning. It was evident at once that we were getting into a different climate, for here it was fairly dry and warm and quite windy, whereas at New Orleans it had been wet and cool. The vegetation was also quite different at Houston. There were practically no trees out in the open country, except a few scattered mesquites, with which the country was formerly covered. This tree or brush makes a growth about like the plum tree. It bends easily in the wind and has narrow leaves.



1. Grapefruit in the orchard of George A. Morrison, Mercedes, Texas. 2. A young Magnolia fig orchard after pruning, near Houston. 3. Headquarters of Texas Citrus Fruit Growers' Exchange, Mission. 4. Unloading bananas from boat at New Orleans. 5. Typical view of land covered with cactus and mesquite before clearing

Houston is about 50 miles from the gulf and is located in the coastal plain. It has fine wide paved streets and a skyline of modern buildings that would do credit to any northern or eastern city. Although the city is 50 miles inland, a ship barge canal has been constructed to the gulf which is large enough to accommodate ocean steamers. The canal was constructed along the bed of an old bayou called Buffalo River. The government furnished about $20,000,000 for the building of this canal, and the remainder was furnished by the citizens of Harris county. The port and terminal were built at a cost of about $7,000,000 by Harris county. There are 17 rail lines and 23 boat lines serving the city. Houston is developing rapidly in population and in business and industrial activities.

The Fig Industry

While the principal party was inspecting the shipping canal, W. B. Cook, agricultural agent of the Texas properties of the Missouri Pacific lines, arranged with M. G. Clymer, organizer and president of a fig preserving organization, to take me through the famous Magnolia fig orchards of that territory. This is the fruit that has been attracting so much attention in dining cars and leading hotels and restaurants the past few years. Its history is most interesting. Years ago a Texan imported what he thought were some Magnolia trees from Mexico. As the trees grew, one of them bore figs, and its owner called it his Magnolia fig tree. From this tree, the Texas fig industry has developed. It is said that no one has been able to find the same type of fig in Mexico, although several explorers have searched for it. The variety is believed to reach its best development only in Texas in a strip of territory within the coastal plain 25 to 50 miles from the gulf and extending from a point about 100 miles west of Houston to the Louisiana border. The fig grows best only in heavy black soil, largely because of the greater resistance of such soil to nematode attack. Furthermore, the soil must be well drained, either naturally or artificially. The heavy dews in this territory, the salt air, and the fact that the water table is within 25 to 30 feet of the surface, thus allowing for the rise of water by capillary action, are considered important factors in the success of the industry. The rainfall of the district is 33.8 inches a year on the average.

Orchards Widely Scattered

The fig orchards are widely scattered, although there are a few communities in which planting is concentrated. The Friendwood section is one of the best known. According to a recent survey, there are 12,817 acres of figs in the territory, distributed among 346 growers. The largest orchard under one ownership is 1100 acres in extent. About 10,000 acres are in bearing at present.

The Magnolia fig can be propagated very easily. The variety roots readily from cuttings. These are taken in December and consist of pieces of wood about one inch in diameter and six to eight inches long, taken from near the base of the tree. The cuttings are handled in a nursery row for one year, and then the trees are set in the orchard. Under such a method of propagation, trees of very uniform character are obtained.

In the older orchards, the trees are a rod apart each way, but now there is a strong tendency to plant them nine by 18 feet. Some orchards are interplanted with pecans and Satsuma oranges.

The Magnolia fig develops a shallow root system and requires shallow and frequent cultivation for its best success. During cultivation, many growers work the ground gradually to the trees, thus forming decidedly banked squares around each tree. Burr clover is often grown in the fall as a cover crop, and many growers allow grass to grow. According to Prof. W. B. Lanham of the state experiment station, whom I later met, the fig likes lime, and applications of this material nearly always give good results. Complete fertilizer, next to lime, gives the best results.

Fortunately for the growers, fig rust

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Opposition Program for Farm Relief

THE OPPONENTS of real farm relief legislation, apparently disappointed that the President's veto has not had the desired effect, are now busy developing a program for presentation to Congress next winter. They are willing now, it seems, to compromise with farm relief leaders, provided the farm folks will agree to omit the equalization fee principle. In other words, they are willing to permit farm relief legislation to be passed provided proper precautions are taken to keep it from becoming effective. The tariff would amount to nothing if the duty were omitted, and neither can the principles of the tariff be applied to exported agricultural products if the equalization fee principle is omitted.

The administration forces propose now to present a bill to Congress embodying the principal features of the Curtis-Crisp and the Curtis-Aswell bills, both of which were defeated in Congress last spring. These bills were simply propositions to extend more credit to agriculture and to provide funds by appropriation for loaning to farmers.

Farmers and fruit growers do not need more credit and do not want it. They already have too many debts. What they need is a government policy that will apply the principles of the tariff to American agriculture and thus give them a fair share of the national income.

Findings of the Business Men's Commission

THE BUSINESS MEN'S Commission on Agriculture has announced the completion of its hearings, except for a few selected conferences yet to be held. A report on its findings and conclusions is expected from the committee during the summer. Recently Charles Nagel, chairman of the commission, issued the following significant statement regarding the work of the commission:

"The evidence which has been given is practically unanimous upon the fact of depression, but is varied and at times contradictory, both as to causes and as to remedies. The causes no doubt are complex. Some of the difficulties are regional and, it is to be hoped, ephemeral. These have their specific causes, which differ from place to place. But taken together, they by no means make up the whole story. There is without doubt such a general agricultural depression as calls for its consideration as a national economic question.

"Those who have been consulted practically agree that the country's heritage of fertile land is being impaired, and that for some, if not many, years we have been living on our agricultural capital. Some rural sections of the country, we are told, are, as communities, virtually bankrupt and are for the time carried by the more prosperous urban areas of the state in which they are located. Even the most efficient farmers seem of recent years to have done little better than hold their own, by cutting their expenditures below their accustomed standard. The difficulties of the farmer have tended to be cumulative, since he has not been free to make investments necessary to preserve or increase the productivity of his land."

Confidence in Farm Loan Bonds

CONFIDENCE of the public in the federal farm loan system is indicated by the fact that the last bond issue of $100,000,000 was sold quickly and at a premium of one and one-fourth points, notwithstanding the fact that the bonds carried only four and one-fourth per cent interest, the lowest which these bonds has ever carried.

There are several factors which account for the apparent confidence of the public in these bonds. In the first place, loans are limited to 50 per cent of the appraised value of the farm land and 20 per cent of the insured improvements. The 12 federal land banks are so inter-related that they are collectively and individually responsible for the bonds of the system. The bonds carry more interest than Liberty bonds and are entirely tax-free. They have a ready market at all times and can be used as collateral for loans. The banks issuing these bonds have a combined capital of $57,000,000, and all of this, except about $1,000,000 worth, is owned by the borrowing farmers. Surplus and reserve of the banks amount to over $12,000,000. Any losses occurring on farms which are foreclosed are charged against the surplus. The foreclosures to date have amounted to less than one per cent of the loans.

In the first 10 years of service the 12 banks have loaned approximately $1,332,000,000, and they now have long-term loans on first mortgages which total about $1,180,000,000. There are 4665 national farm loan associations in the system, and they accommodate about 380,000 farmers with amortized loans. The loan associations and the banks together constitute the world's largest mortgage system.

From the borrower's standpoint, the sale of the last issue of bonds at four and one-fourth per cent interest is of particular interest, for the law requires that the money shall be loaned to farmers at not over one per cent in excess of the interest rate borne by the bonds.

The federal farm loan system is making a splendid record and deserves the support and confidence of both investors and borrowers of money.

The Call for Money

IN FRUIT GROWING, as in every other line of business, there are constant demands from various sources for money. Not only do the growing and marketing operations call for expenditures, which are more or less fixed, but there are repeated demands for money which is to be used for the so-called "good of the industry." Such demands tend to come mostly in times of stress. It is then that the promoter sees his opportunity.

We don't want to discourage any good thing. On the contrary, we want to encourage everything that will help the industry and make it more profitable for the people in it, and by this we mean not only the growers, but supply and equipment manufacturers, dealers and others as well. Any loss that occurs affects the industry as a whole eventually, and any gain that comes helps the industry as a whole.

In considering outside demands for money, it must be borne in mind that every time we advance money for such general purposes we increase the operating costs by that much. If it is a proposition that will set up a new organization, then we must bear in mind that by supporting the venture we will simply be helping to set up a new group of middlemen and that we will be adding to the already large spread that exists between producer and consumer. The question simply resolves itself into one of whether the proposition at hand is going to pay back more than it costs. If it will, then it is a good thing. If it will not, then it does not deserve support.

In considering the merits of outside demands for money, we would suggest that the growers ask themselves the following questions: (1) Who is back of the proposition and what has been his record in the past? (2) Does he have any personal interest at stake and is he promoting the venture for the good of the industry only? (3) Is the proposition economically sound? (4) Do the people handling the proposition really understand the industry and its problems? (5) Are the claims of the promoters backed up by actual facts or do they ask you to believe a lot of superficial statements and generalities? (6) Are the operations conducted in secret or will there be an opportunity for interested persons to really obtain substantial information at any time regarding the affairs of the enterprise?

Reclamation and Development Projects

WE HAVE frequently made mention in these columns of the reclamation and development of new lands for agricultural production. The more we see of the country and the more we study this problem, the more we are convinced that it is a serious question for agriculture and for the country in general.

Notwithstanding our present high production, real estate promoters are at work in almost every part of the country bringing new lands under the plow and inducing more people to grow, or attempt to grow, agricultural products. The welfare of the settler is not seriously considered in many cases. From the land developer's standpoint, the principal qualification of the settler is that he have plenty of ready money on hand or that he be able to give a bankable note. If he can meet these qualifications, he is a good subject, of course, and he is led to believe that only an investment in the lands in question stands between him and wealth.

Thousands of people who have in past years risked their all in such ventures have learned better, to their sorrow, but "suckers are not all dead yet" and more thousands are doomed to purchase similar educations in the future.

It seems a calamity that so much of our virgin fertility must be exploited by land agents and others, without regard for the needs of such development. It seems to us only good policy for the fruit growers now in the business to discourage, for the present at least, all development projects of this kind, as well as to voice their sentiments against the promotion of further irrigation and drainage projects by legislative enactment. Furthermore, we ought all to discourage our friends and neighbors from embarking in such ventures.

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Q U A L I T Y A T L O W C O S T

Leading Grape Varieties for New York

EIGHT VARIETIES of grapes deserve special consideration in setting out new vineyards in New York, according to Dr. U. P. Hedrick of the New York Agricultural Experiment Station at Geneva. These varieties, named in order of their ripening, are Portland, Ontario, Worden, Delaware, Niagara, Concord, Sheridan and Catawba.

The Portland and Ontario are two early green grapes developed by the station and are claimed to be superior in quality of fruit and sturdiness of vine to any other early green grape. These two early sorts, with Niagara, a mid-season variety, make an excellent combination for either home or commercial plantings.

The Worden is an excellent early black grape. It is a seedling of Concord and possesses many of the good qualities of this parent. The Worden is especially desirable for home planting and local markets.

The Delaware is regarded as the outstanding red grape. Because of its high quality and ready salability, it should be included in every orchard. Catawba is also a good red grape and is recommended for its high quality and because it keeps exceptionally well until March or later in ordinary storage.

Concord is the best known of all grapes and is still the mainstay of most commercial plantings. It has many good qualities which commend it. Sheridan, a cross between Worden and Herbert, is recommended as a variety to follow Concord. While the Sheridan has not been tested sufficiently to warrant final recommendations, it is the belief of the station specialists that it will prove to be a better commercial grape than that of Concord.

Pays to Fertilize Cherries

BY PLANTING, tending and bringing into bearing under different treatments a large number of cherry trees of the standard commercial varieties, the Missouri College of Agriculture has found that cultivation produces trees that are much more vigorous, come into profitable bearing more quickly and produce much larger crops than trees grown in sod.

Again comparing trees grown in sod without fertilizer and those grown in sod but fertilized with nitrate of soda or sulphate of ammonia, the college has demonstrated that the fertilized trees are healthier, larger, more vigorous and much more productive than those receiving no fertilizer.

Quality fruit will pay this year. Give your orchard good care.

Summary of Fruit Prospects

By C. E. Durst

IN KEEPING with our policy of the past few years, we are presenting again this spring summaries of fruit conditions and prospects in different sections. The first report of this kind was given in the April issue and the second appeared last month. The report given below is the third and last one of this season. Beginning with the July issue, the government crop estimates will cover the situation for the remainder of the season.

In the summaries given below, the state covered by the report is named, and the date of the report and the name of the person furnishing it are also included. The giving of opinions on crop prospects at this season of the year is a treacherous undertaking. The best authorities can easily make mistakes. Conditions change rapidly. These factors should be taken into account by growers in reading the summaries.

Massachusetts (May 9).—Most tree fruits are carrying an excellent bloom. Plums, pears and peaches are now in full bloom and apples are just coming in.

There is a good deal of frost injury reported, though apparently it is not very serious. With apples, one or two blossoms in each cluster will often be found with browned tissues, while the balance appear perfectly normal. Just how this may affect the set it is too early to say.

Small fruits promise well.—*F. C. Sears.*

New Jersey (May 12).—Apples have dropped their petals in central and southern New Jersey and the small fruits are starting to grow. There was a fairly heavy bloom on apples throughout the state, especially on Wealthy, Grimes and Delicious, which had a light crop in many orchards last year. The set upon nearly all varieties appears heavy enough to give a good crop. Slight frost injury occurred in a few orchards.

The set of peaches is good to heavy with some frost injury in a few orchards. Some blossom blight, due to brown rot, has appeared, but in the majority of orchards it is not sufficient to materially affect the crop.—*M. A. Blake.*

New York (May 7).—In the main, all fruits seem to have come through the winter in splendid condition in New York, and spring frosts have seemingly done little damage in regions in this state where fruits are grown commercially. Fruit growers in the Hudson River Valley report that peaches and sour cherries were injured by the frost in late April and the first few days of May but that this injury is not very general. In the sour cherry region about the central lakes of New York, some injury seems to have taken place from frosts the first days of May, but probably there will be a normal crop of cherries in this great sour cherry region. In the apple, peach and cherry region extending for 150 miles along the shores of Lake Ontario, no serious injury to any crop is reported. There is a rumor, not yet confirmed to the writer, that grapes in the Chautauqua grape belt and in Erie county suffered from heavy frosts the first days of May. I cannot believe, however, that this injury has been very serious.

Early fruits are now in bloom, with splendid weather for the setting of crops. An abundance of apple bloom is in sight, although the blossoms are not yet out in the main apple regions of New York. All in all, prospects seem very good for a normal crop of fruits in New York state.—*U. P. Hedrick.*

Virginia (May 10).—Frosts and freezing weather occurred April 22 to 24. The damage to apples in some sections was severe. The heaviest damage occurred around Roanoke and in southwest Virginia, where the damage reached 25 to 100 per cent. Some orchards lost their entire crop, particularly on low ground. Injury decreased with an increase in elevation as a rule. In the southern Shenandoah Valley, considerable damage occurred in the Mt. Jackson, Harrisonburg, and Staunton area. Orchards on low land suffered worst. Injury in the Winchester district was not so severe, as this section is planted largely to York Imperial and Ben Davis, which were not far enough advanced to be killed. The Piedmont region suffered comparatively little damage, although slight injury was reported from some low lying orchards. Peaches seem to have endured the low temperatures better than apples, and prospects at this time are very encouraging.

We have had a splendid growing season, plenty of moisture and warm weather, which have caused rapid growth of the fruit. Growers are making every effort to produce a high quality crop. It is hoped that with the short crop, legitimate prices will be received.—*F. A. Motz.*

Ohio (May 9).—In southern Ohio apples were seriously damaged by the frosts of late April. In some sections they were almost entirely killed. From one-fourth to one-half of a crop is the prospect in much of Lawrence, Washington, Gallia and Jackson counties. Along the lakes peaches and other fruits are practically undamaged. At Wooster nearly a full crop of apples is still in prospect, while peaches and sweet cherries have practically all been killed.—*J. H. Gourley.*

Michigan (May 7).—Within the last two weeks considerable frost damage has occurred. However, this has been spotted, and it is difficult to give an accurate estimate of prospects. Sour cherry blossoms were so seriously injured that the crop will be small. Sweet cherries have been damaged but there is still a possibility for a fair crop. Grapes on low land have been damaged, but taking the state as a whole, there will probably be a medium sized crop. Apparently the small fruits, apples, pears, plums and peaches have not been severely damaged and there are prospects of reasonably good crops of all of these fruits.—*V. R. Gardner.*

Illinois (May 7).—The frosts on April 21 to 23 did considerable damage. The weather during apple blooming was generally unfavorable and the set is inclined to be light in many orchards. Peaches and apples were injured most in low lying orchards, but there are still enough buds left in most places to give one-fourth to one-half a crop in the frost zone. It is difficult to estimate the percentage of the crop at this time because no one can tell how much fruit will come off in the June drop.—*M. J. Dorsey.*

Iowa (May 10).—The severe freezes of April 22, 23 and 24 did considerable damage in central Iowa. The damage seems to be confined to this area. The leading commercial orchards of western, southern, south central and southeastern Iowa report a good crop of apples in sight. At Charles City, there is prospect of 30 to 35 cars of Duchess and Wealthy. Apples are just past full bloom in southern Iowa and are still in the pink in northern Iowa.—*H. L. Lantz.*

Missouri (May 7.).—The freeze during the latter part of April reduced the strawberry crop about 15 to 25 per cent, according to reports. In view of the good stand of plants in most places and a heavy bloom, there is still an excellent prospect for a profitable crop. Grapes in southwest Missouri were damaged considerably but should produce a fair crop. Injury to the apple crop ranges from 25 to 50 per cent, according to reports. It is possible that these estimates may be too high, and we may still count on a fairly good crop from the Ozark region. In central and north Missouri, apples were uninjured and indications are that a full crop will set.

Peaches were severely injured all over the state, but particularly so in southwest Missouri, although there will be, according to reports, some peaches harvested this year. All other

(Concluded on page 22)

Determining Spraying Dates for Codling Moth with Home Brew Pots

By A. R. Chase

ORCHARDISTS of the fruit growing districts of the Northwest are planning on using the "home brew pots" or "cider traps" in helping to establish spray dates for the codling moth as a result of experimental work carried on by Anthony Spuler, entomologist of the Washington State College, stationed at Wenatchee during the season of 1926.

The trapping of adult codling moths by means of cider in jars or cans suspended in the orchard has been practiced in a limited way for many years. Mr. Spuler made this a practical method of ascertaining the date of emergence of moths by experiments in Wenatchee orchards last season. By using large-mouthed mush bowls in place of fruit jars, Mr. Spuler increased the number of moths caught from 73 to 258 per vessel as an average for the season. Mr. Spuler also multiplied the efficiency of the jar many times by changing the position in the tree. When hung in the lower third of the tree, an average of 26 moths were caught per season. When placed in the upper third of the tree, 165 moths per vessel were caught on the average. When placed in the extreme top, the average number per vessel jumped to the astonishing total of 817 moths per season.

Aid in Determining Emergence of Moths

Mr. Spuler found that he was able by means of the cider trap to gauge the rate of emergence of the moths. The third and fourth week in May marked the high point of emergence of moths in the first brood, although some moths were emerging early in May. Only a few scattering eggs were laid in May, due to the fact that evening temperatures were not high enough for egg laying except on two or three nights, and then only a few moths were out. On the last days of May, the temperature rose to 60 degrees Fahrenheit at 8 p. m., and the peak of the egg laying was reached the first week in June.

By means of the cider traps to check on the emergence of the moths, and by use of thermometers suspended in the orchard to check up on egg laying temperatures, the orchardists can now ascertain the exact conditions of the codling moth emergence and egg laying and can also check up on the amount of infestation. Instead of blindly following a 10-day or 15-day spray schedule, whether or not eggs are hatching in the orchard, he can anticipate by timely spray the hatching of the first brood.

Has Displaced Trap Method

The cider trap has displaced the old method of building a trap around the base of the tree as a means of ascertaining the emergence of the moth. A cider trap is usually kept filled with cider which is at the proper stage of fermentation to attract moths, by refilling every two or three days. A larger number of moths are secured per tree and a closer check is possible than by the old tent trap used at the tree base. The thermometer system of finding egg laying temperatures, first adapted in this territory by E. J. Newcomer of the United States Department of Agriculture, has been used in the Wenatchee district for three years with success, but the addition of the cider trap for catching the adult moth has proved a valuable adjunct to the thermometer system. Sprays have sometimes been put on in this district when egg laying temperatures were reached but before there were an appreciable number of moths out to lay eggs. Hundreds of orchardists will now use the cider traps as a cheap method of catching moths and also determining spray dates.

Checking up on the emergence of the second brood moth and the timing of the second brood spray is also possible under the new system.

Mr. Spuler found that 60 per cent of the moths caught in cider traps were female moths and that very few of them had laid any eggs. The moths seemingly are attracted by the fermenting apple juice upon first emerging as adult moths.

Catchings Increased on Stormy Nights

Mr. Spuler also found that upon nights of heavy winds or electric storms the number of moths caught in traps was greatly increased, showing that contrary to general belief moths were brought in from surrounding orchards under stormy conditions.

Growers are now making up large supplies of cider out of cull apples for use in catching the adult codling moth during the coming season. As they are also finding this a cheap method of helping to control the codling moth, they can also make some saving on their spraying bill.

Shelter Belts Have Important Value

A RECENT report of the Canadian government shows the value of shelter belts on the Canadian prairies. Shelter belts have been found to increase the water-holding power of the soil, to increase crop yields and to modify extremes of temperatures and wind movement. They have made possible the growing of hardy fruits in many localities where such fruits could not be grown previously. It was noted particularly that snowdrifts developed to a much greater extent in shelter belt areas than on the open plains, thus providing additional moisture as the snowdrifts melted in the spring of the year.

A SECTION of the 1925 Yearbook of the United States Department of Agriculture, containing 150 pages on insects and diseases of fruits and vegetables, has been reprinted as Separate 929. This publication virtually constitutes a brief textbook with reference to horticultural pests and their treatment. Copies may be obtained from the United States Department of Agriculture, Washington, D. C.

Better Methods of Orchard Cultivation

By Warren R. Schoonover
University of California

CULTIVATION is only one of several interrelated soil management practices. In using the word "cultivation," plowing, subsoiling, and, in fact, all methods of stirring the soil are included. In the soil management problems of orchards, particularly irrigated orchards, cultivation may be looked upon as a practice which is not essential in itself. The fundamentals of orchard soil management are to maintain at all times a supply of available plant food within reach of the roots and to properly control the soil moisture. Cultivation may be an aid or a detriment in maintaining fertility and proper moisture conditions, according to the practices used.

Purposes of Cultivation

There are four purposes of cultivation, and to whatever extent these purposes may be accomplished without stirring the soil cultivation may be reduced or, in some instances, eliminated entirely. These four purposes are as follows:

1. The preparation of the seed bed.
2. Mixing fertility with the soil.
3. Killing weeds.
4. Preparing soil for absorption of water.

Seed Bed Preparation

We are not much concerned with the first purpose of cultivation, the preparation of the seed bed, when we are handling a permanent crop like any orchard tree. Sometimes, however, cover crops or inter-crops are planted, and it is necessary to provide a thoroughly prepared seed bed in order to give these crops a proper start. For annual crops, the preparation of a seed bed means working the soil fairly early and to a depth of from seven to 15 inches, depending upon conditions, to warm the soil and aerate it. This promotes bacterial activity and makes plant food available. The soil may be turned over and over in this process, and, of course, all of this work should be done before the crop is planted. The roots of the annual crop then occupy that part of the soil which was previously stirred and are able to use the fertility thus made available.

With permanent crops, we cannot make fertility available to any great extent by cultivation because in deep and thorough working of the soil, such as is followed in seed bed preparation, the roots of the permanent crop are disturbed, and they are unable to take plant food which may be rendered more readily available by this thorough working. It is particularly dangerous to work citrus orchard soils deeply in the spring, because of the damage done to the root system at a time when the trees are taking up plant food to set the crop.

If it is necessary to prepare a seed bed in an orchard for the planting of a cover crop, the soil should not be worked very deeply except in the fall of the year for planting a winter cover crop. Tree root activity is not great in the fall, and very little damage will result from cutting a few roots at that time.

Another important purpose of cultivation is the mixing of fertility with the soil. Cover crops must be plowed under or at least mixed with the soil by disking, in order that the plant food in them may become available. Manure or other fertilizers need to be incorporated with the soil whenever they are used. If large quantities of bulky organic materials are applied annually, it seems desirable to turn these materials under deeply enough so that subsequent cultural operations do not turn this decaying organic matter up to the surface.

Moderately deep plowing or disking, for the purpose of turning under organic matter or other fertilizers, need not be practiced more often than once or at most twice a year. This type of cultivation should be used at those times of the year when the trees will be damaged least by cutting a few roots. These times are usually late in the fall or very early in the spring.

Kill Weeds

In agriculture the world over, the killing of weeds is the most important purpose of cultivation. Weeds compete with the growing crop for moisture and for plant food, and even in irrigated sections where the competition for moisture can be controlled by extra applications of water, the competition for plant food is very severe. It is unwise to allow weeds or a cover crop to compete with the tree crop at any critical period when the trees need large amounts of quickly available plant food.

This type of cultivating equipment is used by many citrus growers. Too often, because of the ease with which the teeth take hold in the loose mountainous soils, there is a tendency to cultivate too deeply

In tank experiments conducted by Prof. Veihmeyer of the University of California, the loss of water by natural evaporation was 51 pounds in three years, while the loss from a similar tank in which three morning glory plants were growing, was 704 pounds in 144 days. The experiments at the University of Illinois have shown that with unlimited competition between weeds and cover crops, the yield amounted to only about eight bushels per acre. Where the plots were irrigated to make up for the competition with regard to moisture, the yield was increased only about three bushels per acre, while where the competition for plant food also was eliminated, an additional increase of nearly 35 bushels was secured.

Prepare Soil for Absorption of Water

The fourth purpose of cultivation is to prepare the soil for the absorption of water, and in many sections this purpose determines the amount of cultivation and the kind of cultivation to be given. Many of our California soils absorb water more readily if not cultivated at all. Of course, if orchards are to be irrigated, it is necessary to stir the soil in some way so as to make furrows, ridges, or other means for distributing the water through the orchard. Many times we have found that more rapid penetration and more efficient distribution of water can be obtained by the use of the same furrows for two or more irrigations, rather than by following the common practice of cultivation to make new furrows.

Frequently cultivation, especially when the soil is wet, forms a cultivation sole which interferes seriously with the penetration of water. There are few exceptions to the rule that a reduction in the number of cultivations will make irrigation easier. Sometimes deep and thorough working is necessary in order to secure moisture penetration, and this method should be employed when the soil is relatively dry, so that it will be shattered by the tool rather than packed.

Less Cultivation Does Not Mean Greater Moisture Loss

There is not space in this article to go into a discussion of the extent to which cultivation conserves moisture, if any. This subject has been much discussed, and the writer believes it is now pretty well established that cultivation does not in itself save appreciable amounts of moisture, except to the extent to which it kills weeds which would rapidly withdraw moisture from the soil. At any rate, moisture losses by evaporation from orchard soils are confined to the upper few inches whether the soils are cultivated or not, while moisture losses through use by trees extend to a depth of several feet. If moisture is lost from a weed-free surface soil through failure to cultivate, this loss is insignificant compared with the total amount used by the tree. We find from plot work that the rate of loss of moisture from the root zone of full grown citrus trees is not appreciably influenced by cultivation, and where there has been any difference, it has apparently been in favor of the non-cultivated plots, that is, there has been a somewhat more rapid loss of moisture from the cultivated plots than from the non-cultivated plots. These differences are believed to be within the limit of error in the determinations.

A number of experiments have been conducted in citrus orchards in which cultivation has been eliminated entirely. As was pointed out earlier, the two fundamentals to soil management are maintenance of a supply of available fertility and proper control of soil moisture. In one lemon orchard of four acres, which is one of the most profitable lemon orchards in California, the soil has not been stirred in any manner for 15 years. The orchard is on a hillside and is irrigated by surface flumes or irrigation pipes conducting water to each tree. On

the uphill side of each tree a small pile of manure is placed every year. The end of the flume rests on top of the pile of manure. Fertility is maintained by leaching the soluble plant food from the pile of manure down into the root zone. Proper moisture conditions are maintained by irrigating at regular intervals so that the trees never suffer. Competition between trees and weeds is eliminated by mowing or pasturing. Here is a grower who has to do a lot of hand work but who has found a practical system to maintain fertility and control moisture without stirring the soil. His yield of lemons has been very profitable, and he has not had the expense he formerly had of hauling soil back into the orchard following erosion of the cultivated soil during the winter storms.

Tools to Use

In order to accomplish the useful purposes of cultivation, an orchardist farming irrigated land does not need a great deal of equipment. A disk is a useful tool for killing large weeds and for mixing cover crops or fertilizers with the soil. Some people have complained that a disk is more likely to produce a cultivation sole than other tools. This will not happen if the soil is dry enough to work. In using a disk or any other heavy tool, the condition of the soil six or eight inches below the surface should be examined, and the ground should not be worked until it is dry enough at that depth to crumble rather than pack. A plow is useful in turning under fertilizers and sometimes in making irrigation furrows or ridges. If furrows are not made with a plow, some furrowing out tool will be necessary. For the purpose of killing small weeds, a spring-tooth harrow or a cyclone weeder will frequently be found satisfactory.

If the grower looks upon cultivation as having no virtue in itself but being merely a means of maintaining fertility or of controlling soil moisture, he will cultivate only when absolutely necessary to serve one of the purposes above mentioned, and he will adapt his tools to the particular purposes to be accomplished. For example, a plow or heavy disk may be used to turn under fertilizer, while for killing small weeds, once over with a spring-tooth harrow may be sufficient.

Frequently, a soil worked only enough to accomplish the really beneficial results will look cloddy and unattractive. It is not necessarily true that "good-looking" farming is good farming. The production of the maximum amount of high quality fruit with the lowest production cost is the end to be attained. A careful consideration of the purposes of cultivation will enable growers to reduce their production costs.

New Process for Cleaning Blueberries

A LARGE PORTION of the blueberry crop of 1926 was saved to Maine growers as a result of a process invented and patented by B. J. Howard and C. H. Stephenson of the Bureau of Chemistry. The patent covers a process for removing maggots, debris and unfit berries from the product. Last year it prevented great losses to growers and also made it possible for consumers to secure higher quality berries.

Under the Federal Food and Drugs Act, only clean, sound berries free from maggots may be canned and sold. The blueberry maggot develops from the eggs of small dark flies. In view of the severe infestation last year, Messrs. Howard and Stephenson were detailed to study the problem, and it was during this study that the process was developed. It was used with great success by nearly all the canners in the area infested. The method can be used at small cost.

The method removes the defective blueberries by the controlled action of water and the mechanical crushing or grinding of the blueberries on each other. The blueberries containing maggots or which are partially decayed are usually more easily broken up than sound berries. During the process, the broken or crushed berries are removed. The berries are revolved in hollow cylinders covered with screen, so constructed as to revolve readily while being partially submerged in tanks of water, the water level being maintained automatically at any desired point. An adjustable overflow pipe, which drains from the bottom of the water tanks, insures a constant level for the water and also provides an effective means for removing the maggots and debris which tend to settle to the bottom.

One machine will effectively treat 350 to 500 bushels of berries in a day, depending upon the condition of the fruit. One million dollars worth of blueberries are canned in Maine in some seasons. In one county, the blueberry crop is the chief source of income for a large proportion of the people.

Why Bordeaux is Used as a Summer Spray

THE QUESTION is often asked as to why it is necessary to use two fungicides, lime-sulphur in the spring and Bordeaux mixture in the summer, when both are effective in controlling diseases.

It has been found by experiment that Bordeaux mixture has a tendency to burn the foliage and russet the fruit when used in cool, damp, cloudy weather. As this kind of weather frequently occurs in the spring, it is necessary to use some material that will not have this effect. Lime-sulphur is an effective fungicide and may be used with safety at a time when Bordeaux would be harmful.

On the other hand, lime-sulphur used in hot, dry weather will cause injury to the fruit and foliage. Bordeaux does not affect the foliage or fruit under these conditions and is, therefore, recommended for the later sprays.

Bordeaux mixture should be thoroughly agitated, as spray injury is liable to occur if the material is allowed to settle and become concentrated at the bottom of the tank.—*Virginia Extension Division News.*

International Congress of Soil Experts

THE FIRST International Congress of Soil Science will be held at Washington, June 13 to 22. Soil experts from all over the world will be present. The meeting will be held under the auspices of the International Society of Soil Science, of which Dr. J. G. Lipman, director of the New Jersey Agricultural Experiment Station, is president.

In the 10-day sessions every phase of soil studies will receive consideration. Representatives from 25 nations will take part in these meetings, and it is estimated that at least 100 soil experts from foreign countries will participate. Probably all of our own 48 states will be represented. President Coolidge will address the Congress on the afternoon of the first day, and a reception will be given to the delegates on the evening of the second day by Secretaries Kellogg and Jardine. Following the sessions in Washington, the delegates will take a 30-day trip across the country to the Pacific Coast and back, during which they will study soil conditions, irrigation projects and types of farming.

"California" Grapes in New York

"CALIFORNIA" or European grapes have been growing in the New York Agricultural Experiment Station at Geneva, since 1911, according to Dr. U. P. Hedrick, the station horticulturist. Certain modifications in practice have made possible the successful production of Malagas, Tokays and Hamburgs in spite of the rigorous western New York winters. It is believed that these grapes will succeed in other eastern grape districts with similar character.

In 1911, cuttings of about 100 varieties of European grapes were grafted on roots of native grapes growing in the station grounds. In the light of the experience gained thus far, a better selection of rootstocks can now be made which should insure better results, according to Dr. Hedrick.

The successful production of these grapes in the East appears to depend upon (1) protection of the vines against cold; (2) the use of rootstocks which will insure freedom from phylloxera; and (3) proper spraying to control diseases and insects. The last two requirements are easily met, and vineyard operations can be modified so as to give winter protection to the vines at an added cost estimated at from two to three cents per vine.

Whether or not the European grapes can be grown commercially in the East remains to be determined. It is considered practical, however, to grow these grapes for home use or for local market or the roadside stand. The New York Agricultural Experiment Station will gladly furnish more detailed information on request.

The Editor's Mail Box

Pigeon and Poultry Manure

Editor, AMERICAN FRUIT GROWER MAGAZINE: I have three acres of land and 800 pairs of pigeons. In addition, I have the blood and feathers from about 6000 to 8000 squabs each year. All the ground is set in apple trees. I raise potatoes, raspberries and strawberries between the trees. Please tell me how I can use the above fertilizing material to the best advantage under my conditions.—G. K., Iowa.

ANSWER: I see no reason why you cannot make good use of the pigeon droppings in your orchard. By handling this fertilizer properly, I feel sure you can use the same to distinct advantage.

Poultry and pigeon manure are quite rich. They are from two to three times richer in nitrogen than ordinary farm manure, and they also contain from three to seven times as much phosphorus. They contain about the same quantities of potash as horse and cattle manure.

In using poultry or pigeon manure, I suggest that you use it rather thinly. I have seen many cases in which poultry manure was used in too large quantity and in which damage followed. I would suggest that you use a sufficient quantity to supply about the same amount of nitrogen that would be supplied in nitrate of soda or sulphate of ammonia. Nitrate of soda contains about 15 to 16 per cent of nitrogen and ammonium sulphate contains about 20 to 21 per cent. Poultry manure contains about two per cent. From these figures, you will be able to determine the proper quantities to use.

I would suggest that you scatter the poultry manure uniformly and break up all lumps. It is a good thing to work the manure into the soil soon after application. However, good results can be obtained from applying it broadcast, especially on level land, but in such cases there will be more or less loss from surface drainage.

In using such manure for raspberries, strawberries, potatoes, etc., I suggest that you give an application about twice as heavy as the normal application to the ground before planting the crop. It should be thoroughly mixed with the soil. You can probably use some poultry manure to advantage in raspberries and strawberries by applying it thinly to the surface between the rows after the berries have been planted a year or more. The fertilizer should be worked into the soil immediately after application.

Start a Roadside Market

Editor, AMERICAN FRUIT GROWER MAGAZINE: Will you kindly give me your advice regarding the building of a roadside market? My fruit farm is located on the Illini Boulevard, about midway between Bloomington and Springfield. There are no roadside markets between these cities to amount to anything. I grow a lot of apples and some peaches, pears, cherries, plums, prunes, grapes and berries. I have a large cider mill and have already built up a good cider business. I am located at the edge of town and can buy products from a commission house if needed.

What flowers, if any, can I sell to advantage in a roadside market?

Do you think this would be a wise and profitable venture?—W. C. P., Illinois.

ANSWER: It seems to me you are admirably located for successful roadside marketing. Hundreds of growers in all parts of the country are selling their products successfully in roadside markets, and I see no reason why you cannot do the same.

You are fortunate in already having a rather wide variety of fruit. In making any additional plantings, I suggest that you select varieties of rather high quality and good appearance and also that you plan your plantings so as to have a fairly regular supply throughout the season.

With reference to the buying of fruits from a commission house, you can either do this or you can market products for your neighbors and friends. Most of them will be glad to pay you a liberal commission for marketing their products. By developing a co-operative plan of this kind, you can improve your own market and also be of real service to your neighbors.

You should not forget that you can market eggs, poultry, certain dairy products, canned fruit and vegetables and cured meats of all kinds in a roadside market. The amount of products marketed in some roadside markets is surprising. Not long ago, I heard of a market in Michigan that sold over $60,000 worth of fruit last year. I heard of another market in another state a short time ago which sold more than this.

Your market should be located at a turn in the road or at some point where the motorists are inclined to slow down. If you can find some trees, locate your market near them. Construct a building of good appearance and arrangement and paint it attractively. Provide an easy place for turning off the main highway, and also arrange plenty of space for parking. Locate your market on the right side of the road as the motorists go into town. When motorists are returning to town, they are in a much better mood for buying than when they are hastily leaving, and furthermore, it is easier for them to turn off at a market on the right side of the road than on the left side.

Advertising is an important matter in connection with a roadside market. By all means, use signs for some distance on both sides of the market so motorists will know when they are nearing the market. The reading should be very short and snappy and in large enough letters to be read easily. You can undoubtedly use local newspaper advertising to advantage, especially during times when you have large crops to market.

Keep your prices within reason. Many roadside marketers have damaged themselves and the roadside marketing idea by charging too high prices when they saw their opportunity to collect them. In general, the prices should be enough lower than the retail prices in the cities to pay consumers the cost of going after the products.

You can undoubtedly sell flowers in your market as well as other products. Roses, peonies, chrysanthemums and many others will sell well. In fact, you should be able to sell almost any flower that you can grow well. I would suggest that you begin to grow a few flowers and gradually extend the plantings of those which you find you can sell to advantage.

California View on Reclamation Projects

Editor, AMERICAN FRUIT GROWER MAGAZINE: I noted with interest the letter from Mr. Auvil regarding reclamation projects. If anyone has the impression that California farmers are wildly enthusiastic about government reclamation irrigation projects, someone has mistaken the voice of the politician for the voice of the farmer.

The apologists of government reclamation, which has resulted in so much grief to settlers, so much loss to the taxpayers and so much addition to the agricultural surplus, wave the matter aside by saying that the value of crops grown on reclamation projects was only about $60,000,000 last year, or only about seven-tenths of one per cent of the total production. Therefore, they claim, the production was negligible in lowering the prices of agricultural products.

Today everybody, except promoters, governmental and private, realize that there is an actual agricultural surplus. While it is doubtless correct that the government reclamation projects have added less than one per cent to the total volume of agricultural production, how about the percentage of the surplus? While the production from reclaimed lands may not be more than one per cent of the total volume of production, it is my opinion that the production from reclamation projects amounts to about 10 per cent of the exportable surplus. As we all know, it takes only a small surplus to crash prices, so the addition of 10 per cent to a surplus is an important and unwelcome addition.

How quickly union labor complains if prison-made goods come into competition with goods produced by free labor.

How patient the farmer is when Uncle

Sam spends millions of dollars to increase agricultural competition. Will Rogers says: "It's sort of funny. Congress has been trying to pass about $250,000,000 to help dispose of the agricultural surplus and at the same time, on Capitol Hill, they have been trying to raise about $200,000,000 to build dams to use for creating a lot more of agricultural surplus."

The California farmer and fruit grower, now that his annual returns are figuring out mostly in red ink, is just beginning to think that maybe governmental boosting and appropriating of money to increase competition among farmers is not such a grateful miracle after all.

However, when a big dam is to be built, there is a strong California tendency to metaphorically tar and feather any citizen who questions the advisability. That is why the noise of the boosters drowns out the modest murmur of the inarticulate farmer.—Frank T. Swett, California Pear Growers' Association, San Francisco.

ANSWER: I appreciate very much your letter of recent date. The contents were particularly interesting. It is surprising to receive such an opinion from a Californian, for I must confess I had the feeling, as a result of the publicity which has come out of your state, that a great many Californians were favorable toward the development of reclamation projects.

You have brought out a most important point. It is true, as you suggest, that the food products grown in reclaimed areas are entirely additions to the surplus, which is already a serious matter. Viewed in this light, the production of reclaimed areas must be regarded as a much more significant matter than would be indicated by a consideration of its volume only.

I have begun to feel very strongly in the last few years that the condition of fruit growers is affected to a very marked extent by the condition of agriculture in general. When the condition of agriculture with respect to the great basic food products is favorable, fruit growing is also in a favorable condition, and vice versa. Of course, I am aware that the relative yields of fruits and general farm products in a particular season have an important bearing, but aside from such influences, the condition of fruit growing and agriculture in general moves together. If we can all work together to get the government to delay further development of reclamation projects at present, we will have accomplished something really worth while in the solution of one important factor in the agricultural problem.

Opposes Further Credit Legislation

EDITOR, AMERICAN FRUIT GROWER MAGAZINE: Although we live in Minnesota outside the regular fruit belt, we find a lot of good advice and inspiration in the AMERICAN FRUIT GROWER MAGAZINE. All the departments are very interesting, and they help to widen the knowledge of the fruit producer.

I appreciate your stand for the farmer. Any farm measure that has for its purpose the granting of more credit to farmers is wrong. Legislation which will lower the price of manufactured articles would probably help the farm situation. The eight-hour day, the high standard of living and all the new inventions that affect the living standards of everyone are factors that make the farm relief problem an immense one. Everyone wants to live as comfortably and as high as possible. The majority of people live only in this life and care little about promised rewards in the future life and less yet about punishment there.—*H. Husser, Minnesota.*

Fertilizers for Young Peach Orchard

Editor, AMERICAN FRUIT GROWER MAGAZINE: I have a peach orchard of 2000 trees ranging in age from one to five years. Please give me your best advice on the kind and amount of commercial fertilizer to use for trees of different ages. My orchard is growing on black gravelly land with a red sub-soil.—J. W. W., Georgia.

ANSWER: I rather think that your soil is sufficiently rich in potash and that you will not need to make applications of this element. There may be some shortage of phosphorus and it may pay you to use acid phosphate or steamed bone meal. I suggest that you make some trial applications of about 500 pounds to the acre and see whether the applications do any good. If they prove worth while, you can then apply more phosphorus.

It is quite likely that nitrogen is lacking in your soil. You can supply this by using either nitrate of soda or sulphate of ammonia. The nitrate is somewhat quicker in action, though in practice the sulphate seems to give equally satisfactory results. Many fruit growers decide which one to use on the basis of cost of the nitrogen. Nitrate of soda contains about 15 to 16 per cent of nitrogen and sulphate of ammonia contains about 20 to 21 per cent. You can determine the relative cost of the nitrogen from these figures and the cost of the materials. In regard to the amount, I suggest that you use about one-fourth pound for each year of age of the trees. A four-year-old tree, for instance, would require one pound. Pulverize the fertilizer and spread it around under the branches. There is no need of applying it close to the trunks. The feeding roots are out under the branches. Some growers disk or cultivate the fertilizer into the ground, and this is advisable on rolling land. However, many growers, especially on fairly level land, allow rains or natural soil moisture to bring about absorption of the fertilizer. Nitrate of soda or sulphate of ammonia should be applied early in the spring, about the time the buds are beginning to swell.

Another way to supply nitrogen is to grow legume crops, such as clovers, alfalfa, soybeans, cowpeas, vetch, etc. These take nitrogen from the air and store it in the soil. They also supply organic matter when turned under, which is highly essential. It is a good thing to grow a legume crop every year or two in the late summer and plow it down the following spring. During the early part of the season, it is usually best to cultivate when a crop is being produced, as the trees need all the moisture available. However, after the crop is ripened, a legume crop can readily be grown. In view of the long falls of your section, you should have no trouble in keeping up a good supply of nitrogen and organic matter by the growing of cover crops in the late summer and fall, and I suggest you make a practice of growing them.

Cherry Scions Received from Germany

A SHIPMENT of the Hartz Bird cherry scions has been received from Germany by the Division of Pomology of the University of California, to be used for experimental purposes. These scions will be used as a foundation for building up a quantity of material to test out for resistance to various trunk diseases, the variety being supposedly very resistant to such diseases as gummosis as well as to sunburn. The variety seems to be nothing more than a Mazzard type. It is also claimed that the roots are long lived and quite hardy. —*M. J. Heppner, University of California.*

No Argument There

Wife (teasingly)—Do you know, George, you looked awfully foolish when you proposed to me?

George—Well, very likely I was.

How to Care for Frosted Grapevines

By J. R. Cooper
University of Arkansas

WITH the grape crop for this season in the Concord grape area nearly a total loss, the question of treatment of vineyards during the following season arises.

We must not, in the face of the present loss, overlook the fact that next year's crop is also partially involved. To insure a good crop next year, we must provide the proper kind and amount of fruiting wood. There is some danger that, if the vines do not receive some attention in the way of pruning following this heavy freeze, we may not have a good supply of the right kind of wood. Where the new shoots have been only partially killed back the chances are that new growth will arise from every node. There may be so many of these new shoots that none of them will attain sufficient size to afford good fruiting wood for next year. In such cases if no fruit remains, one of two treatments seems necessary.

One method is to go over the vineyard and snap off all of the new shoots. The present shoots have arisen from the largest of two or three buds found at every node or joint of the cane and in most cases a secondary bud remains at the base of the young shoot. Where the shoots are snapped off, this secondary bud, if uninjured, will throw out a new shoot and may produce a small crop of grapes. Where this operation has been performed relatively early in the season, 15 to 20 per cent of a crop has resulted. This late in the season, however, the value of this procedure from the standpoint of a crop this year is more questionable. It will, however, insure good fruiting wood for another year. These shoots can be removed to the best advantage by taking hold of them close to the union of the cane and pushing sharply to one side. If the force is applied backward, there is danger of injury to the secondary bud.

The other method, and one which will be less expensive than snapping off new shoots, consists merely of cutting back old canes, leaving three or four of the present shoots on each shortened cane. New shoots will arise from these present shoots if they are not entirely killed, and from secondary buds. These will furnish plenty of wood for next year but they will lessen the chances for fruit production from secondary buds. We must not overlook the fact, however, that the chances for fruit production from secondary buds will be very low this late in the season. The vines should not be too heavily cut back, because if only a few shoots arise, the growth will be so vigorous that only bull canes will result. From the standpoint of fruiting wood for next year, this second method is believed to be superior to the first in that more fruiting wood will be produced close to the trunk.

In case the new shoots are frozen back almost to the cane there will be no necessity of doing anything in the way of snapping shoots or cutting back, since, in such cases, the only new growth that will occur will be from the secondary buds. Where sufficient fruit remains to warrant such procedure, the shoots should be left.

From the standpoint of vineyard sanitation, at least one good spray with Bordeaux mixture should be given after the plants begin to recover. No change should be made in early cultivation unless the very early cultivation be made more thorough. However, thorough cultivation need not extend quite so far in the season as with a good crop on the vines. As a matter of fact, it may be found advantageous to stop cultivation sooner in some vineyards, at least, in order to check growth. If it is apparent that vines are making too much growth, they may be checked to some extent by planting a cover crop in the vineyard that will compete for water. If, on the other hand, there is insufficient growth, cultivation should extend later in the season.

THE DIRECTOR of a co-operative occupies a position of responsibility and liability. The directors possess all the powers that the association has under the law. These powers are executed by the officers, agents and employees, but the "constitution" for their acts is the board of directors. The directors determine directly or indirectly the acts, plans and methods to be performed or followed.

The directors are responsible for supervising the activities of the association in a fundamental way. Negligence may render them liable on account thereof. The directors of an association are not insurers of its success, but they must use reasonable care in conducting the business.

Directors cannot fix salaries or compensation for themselves unless authorized by the articles of incorporation, by-laws, or the statute under which the organization is organized. Such power is possessed by the members only. The directors and officers are presumed to act without compensation unless provision for compensating them has been made. If any of them work regularly for the association in matters not involving their time as directors or officers, it is assumed that reasonable compensation will be paid them.

In order to bind an association, the directors must act at a regular or special meeting called for the purpose. A majority of the directors acting in a board meeting that is illegal for any reason cannot bind the association. Action taken at an illegal meeting may be adopted and ratified at a later legal meeting, but directors who were not notified of a board meeting cannot later waive the failure to give notice or concur in action taken at the illegal meeting so as to bind the association. If a director receives notice and fails to attend the meeting, his absence does not affect action taken if a qualified quorum was present.

In the absence of a statutory charter or by-law provision, a quorum consists of the majority of the directors who are not personally interested in the subject before the board. If the majority do not attend a duly called meeting, any business conducted is void. Directors cannot vote by proxy, but if a qualified quorum is present, a majority may exercise any powers of the directors. If one of the directors whose presence is necessary to constitute a quorum is disqualified because of his personal interest, any action of the body is void.

In some states if a director votes upon a proposition which is adopted in which he has a personal interest, the action may be set aside even though the resolution might have been adopted without the vote of the interested director.

If a director acts on a matter in which he has a personal interest, the court will not inquire as to whether he acted fairly or unfairly but will hold that he may not, as a director, deal with himself. Directors and officers of any corporation may be compelled to account for gifts, gratuities or bonuses received by them from persons having business relations with the association. The object of this is to keep the judicial judgment of a director free from any suggestion of personal interest.

In some states if directors fail to file the report required, they are personally liable to creditors. Directors should ascertain the duties and liabilities imposed upon them and should govern their actions accordingly. They should familiarize themselves not only with the co-operative statute of their state, but with the constitution and the general statutes of the state as well.—*Abstract from article in Agricultural Co-operation by L. S. Hulbert.*

FIFTY PER CENT of the farmers' business associations in the United States engage to some extent in co-operative buying. Some of them are formed exclusively for that purpose, although the majority buy commodities simply as a side-line, their main function being co-operative selling. Co-operative purchasing was reported by 5386 associations last year, according to reports received by the United States Department of Agriculture. Of this number 62 per cent bought feeds; 47 per cent, fuel; 30 per cent, concontainers; 20 per cent, seeds; 19 per cent, fertilizer; 15 per cent, building materials; 13 per cent, fencing material; 11 per cent, implements and machinery; seven per cent, hardware; five per cent, spray materials; and 30 per cent handled miscellaneous commodities.

Purchasing activities are not confined to the co-operatives of any particular section of the country. The largest percentage of co-operatives engaged in purchasing, however, is found in Maryland, New Jersey, Kansas, Ohio, Nebraska, Pennsylvania and North Dakota. More than 60 per cent of the associations in these states purchase supplies for their members.

The associations in New England and the middle Atlantic states bought largely feeds and fertilizers, and the associations in the south Atlantic states, fertilizers and seeds. Those in the north central states bought feeds and fuel largely, and those in the Pacific Coast states, containers, including barrels, baskets, bags, crates and fruit packages.

By commodity groups, the percentage of associations reporting co-operative buying were as follows: grain associations, 86 per cent; fruits and vegetables, 58 per cent; forage crops, 50 per cent; poultry and poultry products, 39 per cent; wool, 34 per cent; cotton and cotton products, 27 per cent; livestock, 23 per cent; dairy products, 18 per cent; nuts, 13 per cent; and tobacco, eight per cent.

A NEW IDEA in co-operative marketing is apparently going to be tried out in the Shenandoah-Cumberland apple belt, which comprises territory of four states. The proposed plan calls for the setting up of an overlord or dictator for the marketing of apples from this section. The plan will be comparable to the dictatorship of Judge Landis over baseball and that of Will Hayes over the moving picture industry.

"The 'apple czar,' under the proposals advanced, would operate from an office central in the belt, and all quotations and all sales, made by exchanges and individual salesmen, would be passed through his office. Quotations would be set in the first place at frequent intervals by a 'quotation committee, of men who know the situation. These would be followed rigidly by the salesmen, which would tend heavily to abolish the ruinous price cutting among the various sales agencies in the past. The dictator would make use of all possible means in studying the markets of this country and the world, and would have some power in regulating and directing shipments of fruit, so that markets would not be flooded,

glutted and ruined, as they sometimes are under the present headless 'system.'

"The various sales organizations would lay their books fully before the director-general, according to the plan, and would be given preference in dealing with their old-established customer. The director-general and his activities would be financed by the sales organizations themselves, through a tax of one, two, or three per cent of their commissions.

"The proposal to substitute this plan temporarily for the much more laborious building of a true co-operative through the forming of locals and, on top of these a central sales exchange, was advanced by Director Nat T. Frame, of the extenson division of West Virginia University, with the plain statement that it was being advanced because of the realization that the more thoroughgoing co-operative structure could not be erected inside of, possibly, the next five years; that some immediate action was necessary to prevent a repetition of disastrous marketing happenings of past years; and that this promised to do considerable good."

NOT LONG AGO we announced that the United States apple and peach grades had been adopted in Indiana. Following this step, a new association, called the "Hoosier Apple and Peach Growers, Inc.," was organized at a meeting of interested growers held in Indianapolis on March 29.

At present, six of Indiana's largest commercial orchards are represented in the new company. They include the orchards of the Laurel Orchard Company, Laurel; D. B. Johnson and Son, Mooresville; Hobbs-Hawkins Orchard Company, Mitchell; Holmes Brothers, Mitchell; Hall Orchard Company, Seymour; and A. F. Bentley, Paoli.

The company will use two copyrighted brands, one for apples and one for peaches. All fruit sold under either of these brands must be packed according to the rules of the organization and shall be federal inspected. It is intended to furnish consumers a guaranteed quality pack.

Negotiations are in progress with a large commission firm for the establishment of a central sales agency. The brands of the association will be advertised by means of a small levy placed on each bushel sold. The leaders of the association hope that before long the greater part of the fruit grown in Indiana will be sold through the new organization.

THE FINAL settlement for the 1926 apricot crop has been made by the California Prune and Apricot Growers' Association. The net income from the sale of fruit was $1,195,626 and the income from the sale of pits was $56,741. The expenses of marketing the fruit and pits were: fruit, $118,363; pits, $5051. The growers' share of the fruit sales amounted to $1,077,263, and the growers' share of the pit sales amounted to $51,689, making a total growers' credit of $1,128,952. Deductions were made from the growers' credits for the expenses of issuing the Sunsweet Standard, for an association allowance of three per cent, and for the retirement of preferred stock for the Growers' Packing and Warehousing Association, Inc., for which common stock was issued to the members. These deductions amounted to $50,283. Since advanced payments had already been made to growers for both fruits and pits, the final payments amounted to $246,494.

GREECE has two kinds of co-operatives, agricultural and urban, according to a recent consular report. On June 30, 1926, there were 5103 co-operatives in the country, of which 4060 were agricultural and 1043 urban.

Most of the sales organizations handled raisins, tobacco and olives, while among the productive associations olive oil, wine and dairy products are the leading products handled.

Previous to 1914, there was little co-operative activity in Greece. In that year, the co-operative law was passed, and since then the government has encouraged and supported the co-operative movement. General supervision and control of the associations is maintained. The consular report states that "the idea of mutual help and liability among the members of the associations is day by day improving, without, however, yet having reached the desired level, with good prospects for the future."

THE THREE RIVERS Growers' Association of Kennewick, Wash., conducted business to the amount of $264,365 for the year ending September 20, 1926. Shipments consisted of strawberries, cherries and a number of vegetables. Of the f. o. b. net sales, growers received $228,935, or 86.6 per cent.

THE ORANGE County Berry Growers' Association of Paoli, Ind., was organized early this spring as a result of the efforts of E. H. Ross, county agricultural agent. Approximately 200 acres of strawberries were planted by members of the association this season. Most of the plantings are of the Premier variety.

When the berries come into bearing next season, they will be pooled in carlot shipments. The industry will be a new one for the county, and the growers are putting every effort into the enterprise in the determination to make it a success.

A NEW CO-OPERATIVE called the California Fig Exchange has been organized for the purpose of developing markets for fresh figs. It is proposed to standardize the product as to quality, pack and containers, to reduce the cost of picking, packing and shipping and to develop new markets. All fig growers are being asked to become members of the organization. In some sections of the fig producing area, efforts are on foot to organize the growers in local units.

EGYPT now has 141 agricultural co-operatives with 10,807 members as a result of the law passed in 1923 to facilitate the spread of the movement to safeguard its interests.

Under the plan being followed, the co-operative inspectors in the promising districts have held open air meetings explaining to the growers the advantage of co-operation and acquainting them with its ideals and its possibilities. The growers are told definitely in language they can understand how a co-operative can be started and operated. Additional visits are made to the same districts if sufficient interest is shown. When the growers desire to organize, the inspectors aid them in getting their organization started and in placing it in successful operation.

THERE are about 500 local co-operatives in Michigan, according to figures collected in a recent survey made by the Michigan State College. There are about 140 livestock associations, 130 grain associations, 100 fruit and vegetable associations, about 70 dairy product associations and 40 associations operating co-operative stores. These co-operatives serve about 90,000 shareholders and members and about 60,000 non-members within the state.

Summer Pruning the Peach Tree

WITH proper treatment, young peach trees should be large enough to produce some fruit by the third season. However, the fruit bearing wood will be limited to the well lighted portions of the tree. For this reason unless summer pruning has been done, these first fruits are usually found only on the "hangers" or low branches and other parts of the tree that happen to be exposed to the sunlight.

Even though the center of the trees has been opened up by dormant pruning, the center and top will usually be a mass of branches and foliage by the last of June. One can readily see that strong fruit buds cannot be formed under such conditions. In order to remedy this, the heavy growth in the center and top should be thinned out. This will allow light to penetrate throughout the tree and encourage the development of vigorous buds in the lower half of the tree.

Ordinarily one systematic thinning the latter part of June will suffice but in some cases a second treatment may be necessary about three or four weeks later. This treatment is usually needed especially during the second, third and fourth growing seasons.

Older trees that have suffered the loss of the crop this year, may need a little thinning in the tops this summer, especially if they have been headed back very much.

It should be remembered that this summer pruning is merely a supplement to the dormant pruning. It would, therefore, be very unwise to do a great amount of pruning at this time in an attempt to shape up trees that received no dormant pruning whatever. This summer pruning should, in any case, be confined to a systematic thinning of the new growth. —*Hoosier Horticulture.*

Report on Tractor Manufacture

A BULLETIN recently issued by the Bureau of Census shows that during 1925, a total of 167,650 tractors of all kinds were manufactured in the United States. Of this number, 122,198 were sold in the United States, and 45,981 were exported.

Of the tractors manufactured, 158,037 were of the wheeled type, 6060 were of the track-laying or caterpillar type, 3456 were motor cultivators, including garden tractors, and 97 were steam traction engines.

Monthly Market Review

THE FOLLOWING summary of the fruit marketing situation was furnished by the United States Bureau of Agricultural Economics on May 10:

"Frost, rain, drought and flood have upset conditions in many parts of the trucking region. The season is no longer to be considered especially early except in the South. Damage of various kinds set the crops back one to three weeks in certain sections. Early estimates of the strawberry crop in mid-season states were cut about one-third and potatoes one-fifth.

"Prices made a stronger showing with the progress of the season. Some lines are higher than a year ago. Others appear low compared with the late season like 1926, but when placed beside those of 1925, an early season, most lines are selling higher than they were two years ago. Earliness has its favorable effect in extending the time for distribution and tending to prevent gluts in mid-season.

Berry Shipments Heavy

"Strawberry shipments continued much larger than they were last May. Many early states, including Florida, Texas, Alabama and North Carolina, greatly exceed last year's total, but Louisiana fell behind the 1926 figures considerably. The April and early May price range of 15 to 25 cents wholesale quart basis covered the bulk of mid-season's sales of good fruit. Some berries sell below 10 cents and a few as high as 35 cents, but the general range has been about half that of the late spring of 1926. Floods, rain and frost damaged some mid-season supplies and cut the expected production about one-third in 11 states from Alabama, north to New Jersey and west to Arkansas and Missouri. This would bring the total May and early June output down to about that of a year ago and would tend to improve the price outlook from the standpoint of producers.

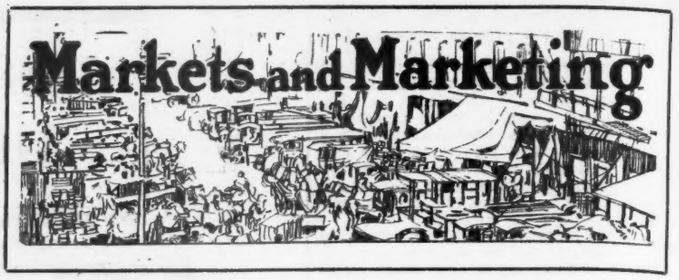
Apples Ending Fairly Well

"Shipments of apples are running about 20 per cent lighter than a year ago, the decreases being mainly in northwestern stock. Late boxed varieties sell a little higher than last season, with tops about $2 for Winesaps at shipping points. Eastern barreled apples in first-class condition from New York and Virginia sell close to last season's prices at $3 to $4 per barrel in the cities; some as high as $5 to $6, and much rather poor stock below $3. Foreign business is light but some rather high prices were quoted recently in British and German markets for the small quantities of best varieties offered in good condition. Spells of frosty weather seem to have reduced the set of the coming crop considerably in the South and West. It is doubtful whether much damage has occurred as yet in the northeastern apple region. The early prospect for pears and cherries seems rather unfavorable in some early and mid-season districts."

Large Test Orchard Set Out in California

WHAT is probably one of the largest plantings of deciduous fruits ever set out for testing the different types of rootstocks used in California has been completed by the Division of Pomology of the University of California. Begun three years ago, the plantings have been carried forward as rapidly as possible, some 3000 trees now being in place.

In this planting, all the known commercial rootstocks have been used, as well as many new promising stocks, budded with the varieties commonly used upon them. The affinity between stock and scion will be studied in an effort to determine the best combinations for the commercial orchards of the state. Information on breakage, unions, growth, resistance to disease, etc., will be gathered from the observations made in this planting, for the use of the California fruit grower. —*M. J. Heppner, University of California.*



IMPROVED METHODS of merchandising northwestern prunes are needed if producers are to receive fair returns in the face of a steadily increasing crop, in the opinion of Department of Agriculture economists.

The department's survey, made through the recently created Division of Co-operative Marketing, was conducted at the request of producers, co-operative associations, and other interested agencies, and related especially to the so-called Italian type prune grown in the states of Oregon and Washington.

Department representatives interviewed wholesalers, retailers, and consumers in 29 cities in a study of consumer demand which showed, among other things, that consumers, except those of the Jewish race, do not know that there is more than one kind of prune. Prunes are "just prunes" to most people. There is a marked difference between the Italian type, which has a tart flavor, and the California sweet prune.

The trend of prune production has been markedly upward in California and the Northwest during the past 25 years. Available statistics show that if the trees already planted are allowed to come into full bearing, the average annual production of prunes in the United States may be 20 to 25 per cent greater than at present in six or eight years.

The trend of prices to growers has been distinctly downward, and many producers are not receiving satisfactory returns for their labor. Available information as to production trends and market demand indicates there probably will be little, if any, marked increase in the general level of prices for prunes from Oregon and Washington over those prevailing in recent years, unless some means of increasing the demand for these prunes can be found.

Department economists declare that lack of full confidence on the part of wholesale and retail distributors in the quality of prunes from Oregon and Washington indicates the necessity for further improvement and for standardization of quality. The efforts of growers and packers should be supplemented, if necessary, by state legislation which would authorize inspection and standardization of the product.

In planning a program to extend the knowledge of prunes from Oregon and Washington among consumers and the trade, growers must take into consideration the lack of uniformity in the size of the crop from year to year; the relatively small supply of these prunes as compared with California prunes, and the difficulty of the average consumer in distinguishing between the two products. Such a program, however, calling attention to the product and teaching the public the methods of preparing Italian prunes, should aid in creating consumer recognition for the product.

Other practices recommended by the department are the careful growing and delivery of prunes of a uniform quality, regularity of supply and co-operation among growers. Between 35 and 40 per cent of the northwestern prune crop is handled by farmers' co-operative marketing associations, which, according to the economists, should form the nucleus of a well-organized production and merchandizing plan. Better prune prices will be gradual, and significant from a long-time point of view rather than for the immediate future.

Prune growers to whom the returns of recent years have not been satisfactory, and who find it difficult to effect these improvements, says the department, should consider whether there are other farming alternatives to which they can turn with profit.

Detailed results of the department's survey have been published in Department Circular 416-C, copies of which may be obtained from the Department of Agriculture, Washington, D. C.

IN RESPONSE to the above investigation, a convention of prune growers of the Northwest is to be held June 28 and 29 at Corvallis, Ore. The meeting is being called by the Oregon Agricultural College with the object of formulating a program of action with reference to organization and marketing. It is hoped that as a result of this meeting, some practical benefits will follow the investigation. Delegates to the convention will be chosen by the growers of each district at meetings to be arranged.

THE LAW recently passed in Missouri for the regulation of commission merchants has been upheld by the supreme court of that state. Certain commission merchants in Kansas City endeavored to enjoin the state marketing commissioner from enforcing this act. After an exhaustive trial, in which the points at issue were reviewed from every standpoint, the court decided that the act was not unconstitutional, and it was therefore upheld in all of its provisions.

THE NEW JERSEY Department of Weights and Measures has notified growers that the use of 30-quart crates as containers is illegal. The warning has been issued as a result of the use of short bushel packages by farmers in certain localities. The department is recommending the use of 20-quart containers for tomatoes.

BOSTON is the next large city which will soon have a new produce terminal. It is being constructed by the Boston and Maine Railway in its Rutherford yards and will be ready for occupancy August 1. It will be called the Fruit and Vegetable Auction Terminal.

The new terminal will have every convenience for efficient and prompt handling of products. Besides having every facility for the accommodation of the business of the 300 produce merchants of the city, the new plant will be provided with means for expansion and growth sufficient to meet all future needs.

The central feature will be a fireproof building 600 feet long and 90 feet wide. There will be two stories on the administration end and a display room and distributing shed beyond. There will be two large auction rooms on the second floor. The lower floor will contain a printing department, a restaurant and administrative offices. The second building is a rebuilt shed of large size which is being brought up-to-date in every respect.

The new terminal plant was planned following a careful study of produce terminals in other cities. The four tracks at the main buildings will have a capacity of 65 cars at one time. The most modern equipment will be used for rapid and efficient unloading. An 80-foot concrete driveway adjoining the main display and distributing shed will provide ample room for trucks.

With the new juice grape yards and house adjacent to the main building, there will be a concentration of terminal facilities for perishable

products that will be superior to anything that has previously existed in Boston.

The new terminal is part of the $4,000,000 improved Boston terminal system being constructed by the Boston and Maine Railway. The facilities of the auction terminal will be coordinated with the new arrangement.

SINCE the strawberry crop is now moving in large quantities in several parts of the country, the origin and destination of the shipments will be interesting to many growers and shippers. The following tables, which were recently issued by the United States Bureau of Agricultural Economics, give an excellent summary of the sources and destinations of strawberry shipments for the United States as a whole:

CARLOT SHIPMENTS OF STRAWBERRIES

State.	Approx. shipping season.	1922.	1923.	1924.	1925.	1926.
Early—						
Alabama	Apr. 1-June 10	460	693	408	421	440
Florida	Jan. 1-May 31	322	1,038	587	668	309
Louisiana	Mar. 1-May 31	1,576	1,678	1,865	1,076	2,342
Mississippi	Apr. 1-May 31	89	141	108	54	53
Texas	Mar. 15-May 25	9	59	76	21	45
Total early		2,456	3,609	3,044	2,240	3,189
Second Early—						
Arkansas	Apr. 20-June 10	2,165	1,342	1,613	993	1,295
California	Apr. 1-Sept. 15	201	226	191	130	104
North Carolina	Apr. 10-May 31	1,101	1,668	2,046	1,634	1,252
South Carolina	Apr. 20-May 20	8	60	70	44	22
Tennessee:	Apr. 25-June 15					
East		1,038	1,172	842	553	305
West		2,113	1,621	1,834	872	651
Central		491	486	226	212	297
Virginia:	Apr. 25-June 5					
Eastern shore		851	712	1,417	745	799
Norfolk section		829	481	502	504	488
Total second early		8,789	7,768	8,741	5,687	5,213
Intermediate—						
Delaware	May 15-June 15	940	924	1,307	472	671
Illinois	May 15-June 20	260	224	367	295	247
Indiana	May 15-June 20	51	26	24	29	52
Iowa	May 25-June 20	73	82	113	37	49
Kansas	June 1-June 30	8	19	40	20	1
Kentucky	May 15-June 15	772	827	467	312	581
Maryland	May 1-June 15	1,634	1,916	2,155	1,092	1,394
Missouri	May 15-June 15	1,963	872	990	1,497	1,434
New Jersey	May 15-June 15	274	187	402	126	207
Total intermediate		5,975	5,077	5,865	3,880	4,636
Late—						
Michigan	June 1-July 10	640	408	554	39	155
New York	June 1-July 15	325	301	345	200	238
Ohio	June 1-June 20	25	8	11	...	...
Oregon	June 1-June 30	141	115	39	57	39
Pennsylvania	June 1-June 30	9	9	27	...	9
Washington	June 1-July 15	188	177	39	42	12
Wisconsin	June 10-July 15	84	151	183	27	34
Total late		1,412	1,169	1,198	365	492
Other states not included above		129	181	125	74	122
Total United States		18,761	17,804	18,973	12,246	13,652

CARLOT UNLOADS OF STRAWBERRIES AT PROMINENT MARKETS.

Market.	1923.	1924.	1925.	1926.	Av.
Baltimore	277	194	322	198	
Boston	1,127	1,237	856	938	1,040
Buffalo	262	338	219	295	278
Chicago	1,696	1,809	942	1,526	1,493
Cincinnati	559	355	340	282	384
Cleveland	393	349	260	279	320
Columbus	179	192	145	154	168
Denver	83	103	89	87	90
Detroit	548	550	413	478	497
Indianapolis	152	178	129	133	158
Kansas City	129	146	145	124	136
Louisville	92	75	44	70	70
Milwaukee	226	213	157	192	197
Minneapolis	246	228	184	236	224
Newark	193	262	144	124	181
New York	2,507	2,537	2,005	1,625	2,168
Omaha	129	90	86	117	105
Philadelphia	750	691	455	363	565
Pittsburgh	516	458	285	360	405
Providence	184	240	134	150	177
St. Louis	277	229	130	171	202
St. Paul	130	152	86	96	116
Toledo	160	170	94	108	133
Washington	62	57	71	61	63
Total 24 cities	10,640	10,936	7,607	8,291	9,368

THE EXPORT trade in dried fruits during 1926 was the largest since the war, according to an article by R. S Hollingshead in the April issue of *Commerce Reports*. The exports for 1926 exceeded in value those of 1924. The following table gives the exports in pounds of the most important dried fruits for the past three years, together with the percentage changes in trade in each product, using 1925 as a base The value of each product for 1926 is also shown:

UNITED STATES EXPORTS OF DRIED FRUITS, 1924-26

Fruits.	1924. Pounds.	1925. Pounds.	1926. Pounds.	Change from 1925 to 1926. Per cent.	Value in 1926.
Raisins	92,139,672	125,923,926	141,037,750	+11.9	$11,177,679
Apples	29,740,472	22,720,824	28,296,050	+12.6	2,974,153
Apricots	30,456,243	20,160,775	15,965,464	—20.8	3,334,080
Peaches	12,551,867	4,412,232	5,334,969	+17.2	775,081
Prunes	220,911,703	146,484,934	158,076,067	+ 7.3	10,635,083
Other fruits	13,150,339	12,005,645	14,825,900	+23.4	1,779,633
Total	398,950,296	331,708,336	363,526,200	+ 8.7	$30,675,709

The traffic in raisins has been particularly interesting. Exports of this product have shown a steady increase each year without the temporary recessions that occurred in the case of each of the other fruits This growth has occurred notwithstanding the determined campaign which has been conducted to increase the consumption of dominion grown fruits in Great Britain, which is the most important market for American raisins

The gains made by the other dried fruits in 1926 were to be expected in view of the short crops of 1925 The low production of prunes in France, together with a normal crop in Yugoslavia, had considerable effect in creating a satisfactory demand for the fruit in Great Britain

The following table gives the exports of dried fruits as a whole to various foreign countries during the past three years:

UNITED STATES EXPORTS OF ALL CLASSES OF DRIED FRUITS, BY COUNTRIES

[In thousands of pounds]

Exported to—	1924.	1925.	1926.	Per cent change from 1925.
United Kingdom	68,365	86,071	94,009	+ 9.2
Canada	61,986	52,232	62,002	+18.7
France	19,696	41,068	24,172	—70.0
Germany	126,581	50,709	62,435	+23.1
Netherlands	43,831	33,321	34,449	+ 3.4
Sweden	14,662	11,304	17,195	+53.8
Denmark	12,857	10,328	12,450	+21.5
Belgium	7,267	8,180	10,309	+26.0
Other countries	43,705	38,495	46,505	+20.8

There were no drastic changes in the pure food laws or regulations affecting the exports of dried fruits last year. Great Britain set very low limits for the sulphur dioxide content of fruits, but the impracticability of these was demonstrated and the tolerances for this year have been raised to permit the entry of well-packed fruit. The disorganized trade conditions in Great Britain resulting from the coal strike have encouraged the consumption of dried fruits at the expense of canned fruits. This tendency may be reversed upon the re-establishment of normal conditions.

The most serious obstacle now facing the export trade in dried fruits is the determined effort being made in the British Dominion to promote "dominion buying." The United Kingdom last year appropriated £500,000 ($2,432,500) for the promotion of this project and it is expected that the amount will be doubled this year. Notwithstanding this program, it appears that the demand for American dried fruits has not suffered materially because of their high quality as compared with that of the products of the competing dominions. If prices can be kept within line, it is believed that a satisfactory demand can be maintained for American dried fruits. Conditions in other parts of the world indicate a continuance in demand for American dried fruits.

A MOVEMENT that may affect the marketing situation appreciably in time is taking place with reference to farm population. The farm population of the country decreased 649,000 persons last year, according to the Bureau of Agricultural Economics. This is the largest decrease which has taken place in any year since 1920.

On January 1, 1927, a total of 27,892,000 persons were living on farms as compared with 28,541,000 on January 1, 1926. The population for January 1, 1927, is taken from the 1925 census figures.

It is estimated that 2,155,000 persons moved from farms to cities or towns last year and that 1,135 000 persons moved from cities to farms, making a net movement of 1,020,000 persons away from the farms. Births on farms during 1926 are estimated at 658,000 and deaths at 287,000, leaving a natural increase of 371,000 persons. The net loss in farm population, therefore, was 649,000.

What Goes Up Will Come Down

"And what would happen if the parachute failed to open after you jumped off?" asked the fair one.

"Oh, that wouldn't stop me!" replied the airman. "I'd come down just the same."

The Orchard Home Department

By Mary Lee Adams

Grass and Fruit Stains

THERE'S a superstition among laundresses that a stain which will not come out in the wash, will disappear naturally when the fruit that made it goes out of season. But this, while relieving the washerwoman's sense of responsibility, has not brought permanent relief to the owner of stained garments. So, if you drop fruit juice on your clothes, or sit too hard on the green grass, or crush young leaves, you'd best use some more active measure than mere watchful waiting.

I've been anticipating the probability of acquiring some or all of these stains this summer and so have sought some information on the subject, which I take pleasure in passing on to orchard women.

Most fresh fruit stains will come out if you promptly pour boiling water through them from a height of several feet. Use this for cotton and linen fabrics only, since silk or wool will stand only warm water, which may be substituted for the very hot water. Always remember that the longer a stain stands the harder it "sets."

Soap, being alkaline, is likely to set all fruit stains except such organic acids as grapefruit and lemon juice. For such stains, the use of an alkali is indicated to neutralize the acid. Baking soda sprinkled on both sides of the material and moistened with a little water, and dilute ammonia are both useful.

Too strong an alkali greatly injures silk or wool and may yellow even cotton cloth or linen. As soon as the stain is removed, rinse in plenty of water to neutralize the alkali and avoid detriment to the material.

When boiling water fails to remove the stain from cotton or linen, moisten the spots with lemon juice and expose for a time to the direct sunlight. A little hydrogen peroxide may be applied to silk or wool, in fast colors or white, after they have been sponged with warm water.

Many persons speak confidently of "sponging" an article, who yet do not seem to understand the proper way to sponge delicate fabrics. The stained portion should be laid quite flat upon some absorbent, like blotting paper or several folds of cloth. This should be changed from time to time as it becomes discolored.

Place the material wrong side up and hold it firmly in place so that it remains stretched and flat. Never use a harsh or linty cloth to sponge with. A piece of cloth similar to the material being sponged, is best.

Fresh grass or foliage stains require laundering with soapy hot water, rubbing well to remove the stain. If the material is of silk or wool, or too delicate to stand this treatment, it may be sponged with wood alcohol. To remove stains successfully and completely, one should always operate in a good strong light. Stains have a disconcerting way of disappearing in shadow and coming out strongly in the sunlight.

A volume might be written on stains and their treatment, but those mentioned here are most frequently a nuisance to us during a summer in the country.

Protecting Wild Flowers

IS YOUR state one of those that have special laws for the protection of wild flowers? In the West especially, people seem aroused to the necessity of giving their exquisite wild flowers protection if they are to be preserved not only for their own delight, but as an actual financial asset in attracting the hordes of tourists who yearly seek recreation amid the magnificent scenery, still abundant wild life and wealth of glorious wild flowers in the West.

Sometimes only certain flowers, such as the state flower or those which by their fatal beauty lure the passerby to destroy them, are thus protected. In the long settled East, many choice varieties have already been driven from all but the most remote localities.

It is now, fortunately, a general practice to instruct school children that they must not pick certain flowers. We should all endeavor to do our share toward saving the flora of our own state. Enlist the children's aid by showing them their responsibility in the matter, and urge them to influence their companions to help in preserving the beauty of the community in which they take a loving pride.

Some of our wild flowers may be picked freely except in localities where they are threatened with extinction. Bulbs such as iris, lilies, etc., of which the seed is not the main source of propagation, may be gathered. Asters, black-eyed Susans, fox-glove, honeysuckle, phlox and violets are not likely to be hurt by picking. But the lobelias, lupines, trilliums, dogwood, fringe tree, and fire pink or Indian pink, should be undisturbed.

All flowers should be carefully picked or cut. To tear them up by the roots or break and pull the plant to pieces, is little better than barbarous.

Knee Deep in June

IF YOU spend the long bright days of summer inside the house, the enchanting succession of the seasons will pass you by untouched and, so far as you are concerned, we might almost as well have 12 months of winter. For the sake of health and happiness, the orchard woman must plan for herself and her children to get as much fresh outdoor air as possible in their lungs all through the vacation season.

For a few fortunate ones, trips away from home or even abroad are possible, but for the main part, orchard families must find their change of scene within a limited radius permitting return to the home every evening. And without any change of scene at all, the back porch, front porch and spreading tree in the door yard, furnish grateful shade wherein children may play, in which many household tasks may be carried on, and where informal meals may be served.

Decidedly, the picnic habit is a good one. The question of picnic lunches need not be nearly so onerous as it is often made. Simple fare is very appetizing out-of-doors, and the sensible way to picnic is not to fuss too much about the food. If you must look forward to long, hot hours of preparation over the stove, you won't feel inclined to picnic often.

Even busy men can find time for one outdoor supper a week. Provide plenty of substantials but nothing fussy, and you'll get no complaint from hungry children or husband. That's the kind of food most men prefer anyway. There's nothing jollier than for the whole family, parents and children, to jaunt away of a summer's afternoon to some pretty spot and there, with perhaps a few friends for good measure of joy, to drink in the cool breeze, revel in the sunset colors, fall to on the beans, eggs and sandwiches, and so home again under the stars.

WHILE the argument rages on as to whether we (who by actual effort of memory were but little lower than the angels in our youth) need spend our tears on the degeneracy of the present boys and girls who make up the bulk of other people's children, it is restful to revert to the cold certainty of figures.

In 14 of our largest cities, reports compiled by the Children's Bureau, Washington, D. C., show a decreased delinquency in nine. New York, Chicago, Boston and Washington, D. C., are on the honor roll with lowered delinquency. The whole outlook is commented on as cheering.

Some Trials Summer Brings

THE SHARPEST thorn in the rose of vacation time is the minor annoyance of insect-pests. When to these are added the poison ivy or oak, and poison sumac, sometimes called poison ashe, the term "minor annoyance" may seem too mild to the victims of these foes from the woods and fields that lie in wait for the unwary.

No need to go far afield in order to invite attack from bees, wasps, yellow jackets or hornets. The grape arbor or peach orchard offers a perfectly acceptable stage for the play of these "bad actors."

Bees and yellow jackets are especially fond of fresh fruit juice, and it requires an iron nerve on the part of the fruit picker to run the risks attendant on twisting from its stem a luscious peach or ripe grape upon which the barbed visitor is feeding.

Better Be Safe Than Sorry

Some people claim immunity and hold the theory that a perfectly quiet and composed demeanor will calm a temperamental bee. I, too, have tried that and have even been convinced that it worked. But alas! in the gloaming, or what we in Virginia call "just about dusky dark," having an irresistible longing for a mellow peach, I placed a placid finger tip on the wrong end of a late-supping bee, with the most painful results.

First aid in the form of plain baking soda, dampened to a paste, proved the worth of that simple remedy. The sting being acid, an alkaline substance serves as an antidote. If the sting is left behind in the flesh, draw it out immediately. A few drops of ammonia water may be applied to the wound. Witch hazel, cold boric acid solution or a compress of very cold water will give relief.

A solution of one part menthol to 10 parts denatured alcohol is handy to keep in the summer country home where children continually, and grown-ups occasionally, are getting stung. Caution is required in making any strong application near the eyes. A remedy men are apt to carry, without thought of its usefulness, is cigarette ashes. Placed on the wound and dampened, these form a curative paste.

Tobacco Juice Proves Useful

The juice of tobacco is also admirable for the terrible sting of hornets. This I saw proved at a picnic held on the bank of a little rushing river.

In the center of the stream rose a tall rock with a few bushes growing precariously on its steep sides. Every country picnic of young people must have its smart Alecs, and a college youth was not lacking to boast he could scale the rock and smoke his pipe on the summit.

Removing his socks and rolling his trousers, he waded out almost waist deep and, by dint of grasping a bush here and there, drew himself up to the top of the rock, puffed his pipe and looked to the bank for applause.

A heartless burst of mirth greeted him and his ears caught a queer, angry roaring. Peering down, he saw a cloud of enraged hornets, whose nest he had disturbed, circling round the base of the rock in an ever ascending spiral.

This was a sorry joke for the victim, since the hornet has the most ferocious of stings. Quaking with apprehension, he realized that his only safety lay in the water. Down he hurtled with a tremendous splash and never came up for air until he reached the bank.

But his bare legs had not escaped. Then some wise one drew the stem from the old pipe and rubbed each sting with the moist tobacco juice gathered at the end. Soon the pain was greatly alleviated.

Crimson Rambler of Woods

The danger from the chigger, red bug or harvest mite, as it is variously called, lies in the possibility of being covered by a myriad of these almost imperceptible bright red burrowers which produce intense irritation of the skin. If you are going through grass or bushes where you will be exposed to their attack, a liberal use of flowers of sulphur sifted through the clothes from neck to heel will keep them at a distance. Naphthalene is recommended for the same purpose. A bath in hot salty or soapy water, if taken within a few hours after exposure, may avert trouble. Later on, the chigger has securely buried itself under the skin. Once the damage is done, best apply freely moderately strong ammonia, and second best, a super-saturated solution of bicarbonate of soda. In cases of intense irritation, a dilute tincture of iodine is recommended.

Mosquitoes Bring Misery

If the fight against mosquitoes has not been actively carried on in your community, if drainage is not complete, if stagnant water is not covered periodically with kerosene oil, if empty vessels that catch rain water are left about, you're fairly sure to be bothered by mosquitoes.

Fortunately, not all mosquitoes spread malaria. They're a wretched nuisance even when comparatively harmless. Screened doors and windows may keep them out of the house. Otherwise, you'll be irritated during your waking hours indoors, and you'll have many more waking hours than you wish. Who can sleep with those tiny trumpeters whizzing about the ears?

Oil of pennyroyal or spirits of camphor will hold back the hungry hordes for a time. Oils of lavender, peppermint, tar and citronella are all unwelcome to mosquitos. A good way to use these deterrents is to sprinkle drops upon a towel hung over the head of the bed. A liquid with the alluring name of "Sweet Dreams," procurable at the druggist's, is said to be very efficacious.

Poisons That Puff and Sting

Worse than insect stings is the eruption caused by contact with poisonous plants. Of these, poison ivy or oak is far the most frequent. This plant, either in vine or bush form, grows freely from coast to coast. Its resemblance to the pretty harmless Virginia creeper, with which it often grows in close proximity, confuses its identity.

The Virginia creeper has five pointed leaves on each stem, the ivy or oak has but three—one for each letter, i-v-y or o-a-k. So we teach children to distinguish the two plants.

The inflammation from the poison causes insufferable itching. Sometimes, the eyes are completely closed by swelling and serum-filled blisters cover the whole body and cause a fever. Actual contact with the leaves or blossoms is usually necessary to infection, but very severe cases have been produced by the smoke from the burning plant.

No Panacea Known

There are many alleviatives. All leave something to be desired, but you'll be glad to use whatever you can lay hands on that offers a measure of relief.

If you even suspect that you have been exposed to contagion, hasten to wash with a heavy lather of soap. When this is washed off, apply fresh lather and allow it to dry on the skin. If swelling and blisters later appear, you may know you are in for it.

As soothing and drying agents, oxide of zinc ointment, stearate of zinc, or a saturated solution of epsom salts, may be applied. A thin paste of bicarbonate of soda, a teaspoonful of boric acid dissolved in hot water and allowed to cool, will refresh the tortured skin. A tea-colored solution of iodine is recommended for those who are not subject to iodine poisoning.

How to Grow Better Strawberries

(Continued from page 3)

have small foliage and multiply less freely. In fertilizing fields, make the applications well in advance of the time that the crowns are to go into the rest period. This will usually mean that the application should be made when or just before the new plants are set. Applied at this time, fertilizer stimulates the mother plants, causing them to send out stolons promptly and establish a matted row. By the time the row is well established, the most quickly available part of a complete fertilizer, nitrogen, is spent, and the less soluble phosphoric acid and potash are left to function more slowly.

Varieties

Strawberry varieties are classified as pistillate (imperfect flowers) and staminate (perfect flowers) according to their flower parts. The staminate berries are almost wholly used for the larger commercial areas. A great many staminate berries have been developed. It seems that varieties have been developed to suit certain local conditions. In Florida, the Missionary, a large prolific early berry, suits the soils and seasons of that state. In Louisiana, the Klondike, a round, subacid, crimson berry, is well suited to local conditions and is almost exclusively grown. In the Ozark region and in the highlands of Tennessee, we find that the small-leafed and large, cone-shaped berry of the Aroma type thrives best and is, therefore, very widely grown but not to the exclusion of the Klondike. In the sandy loams of Maryland, the Chesapeake is quite a favorite and a splendid yielder. In the Middle West, the Senator Dunlap is quite popular and therefore widely grown. The everbearing varieties are not a success on a commercial scale, but if intensely cultivated in back yard gardens, they frequently produce quantities of out of season fruit.

This practical grower insists that standardization pays

Need for New Varieties

In the 75 years that the strawberry has been grown as a cultivated fruit, there have been many new and improved varieties introduced. This marked improvement only indicates what we may expect in the future. Recently, the Department of Agriculture has introduced giant strawberries from Bogota, South America, for cross breeding with our native berries. What is needed is a plant with a reasonably heavy foliage that bears large, evenly-sized, firm berries of good quality on a stiff, upright fruiting spur. Such habits will prevent water soaking of the berries during the ripening season. With varieties that fruit heavily and whose fruits lay directly on the earth or mulch, one often finds that the berries will not ship, although produced in great quantities. The desired new variety should not be too prolific as to producing new vines or plants. The chief objection to many of our present varieties is that after the first picking the berries begin to run small. If a new variety could be developed that would hold its size better throughout the season, it would add hundreds of thousands to the purses of growers.

Standardization Help

Buyers of today use the wire to a large extent to purchase perishables, and they would use this quick method a great deal more if they were sure of the quality and pack. Realizing the necessity for distributing berries as rapidly as possible, the Bureau of Agricultural Economics worked out standard grades. These grades are established and enforced by the use of shipping point inspectors. Where the local associations have co-operated in securing this service, it has improved the quality and pack very materially, and naturally prices returned to growers have been better.

As long as consumers require different sized containers, standardization will be difficult. The crate is the only container used in shipping strawberries. The three sizes in most general use are the 24-pint crate, the 24-quart crate, and the 32-quart crate. Those holding 32 quarts are used in North Carolina: Louisiana uses 24-pint crates, and Tennessee, Arkansas and Missouri use the standard 24-quart crate. If berries are very scarce and the demand good, probably the 24-pint crate is best, but where the supply is plentiful and the demand normal, most shippers are agreed that the 24-quart ventilated crate is the proper package to use.

Disease Troubles

Even if the climate and soil are co-operating to bring forth a bountiful harvest, the grower is frequently robbed of success by the spread of disease. Of the diseases, leaf spot is the most common. It is almost universal where certain varieties are grown. This disease never destroys the entire crop, but under unusual circumstances it may reduce the quality. The best assurance against all diseases is to secure disease-free one-year-old plants of varieties that are not so susceptible. Spraying has a tendency to reduce the damage. Probably the disease that causes the most loss to growers is the rhizopus rot or "leak." Diseases affecting the berries as they ripen frequently cause trouble before they reach the ultimate consumer. Sanitary conditions and the use of Bordeaux mixture have proved valuable in stamping out these diseases.

Insects and Their Control

The crown borer is one of the most serious and widely spread pests, but it can be controlled by destroying all old fields near the new plantings and by using one-year-old plants from borer-free fields. The strawberry weevil occurs in serious outbreaks about blooming time. The damage is caused by the female cutting off the blooms for depositing eggs in the cluster of stamens. This pest can be brought under control by a general cleanup and dusting with lime and arsenate of lead. White grubs frequently give trouble where sod land is planted to strawberry fields. Give clean cultivation for one year, then plant, and this trouble will be avoided.

Probably the strawberry requires less spraying than any other fruit grown in such volume. If the nursery stock is carefully inspected, the fields kept sanitary and nearby sources of infection cleaned up, there need be but little loss from either insects or disease.

Damson Plums Deserving of Trial

DAMSON PLUMS possess many qualities which should commend their use both for home consumption and for local markets, declares Dr. U. P. Hedrick of the New York Agricultural Experiment Station at Geneva. The Damson is in great demand in Europe for canning, preserving, tarts, etc., and is deserving of more attention in this country.

All the European plums are divided into two groups, consisting of Domesticas, to which the large-fruited varieties belong, and the Damsons. The recorded history of the Damsons goes back to 600 years B. C. to the city of Damascus where the Damson or Damask plum is believed to have originated.

The Damsons surpass all the European plums in productivity, vigor and hardiness. The fruits are smaller and more astringent than those of the common cultivated plums. However, for culinary purposes they are unsurpassed.

The Shropshire is the best known Damson in the United States. The French is also a common variety and has larger fruit and more productive trees than the Shropshire. The fruit of the French is also larger and handsomer and it may be eaten out of the hand when fully ripe. The French is believed to be a cross between Shropshire and some Domestica variety.

Another good variety is Mirabelle. Several varieties exist in Europe under this name but the fruit is of small size and they have never found much favor in America. The New York Experiment Station is introducing an American Mirabelle which is larger than the common Mirabelle and which has round, yellow fruit with a sweet, pleasing flavor. The trees are small but extremely vigorous and hardy.

New Bulletin on Orchard Irrigation

THE RESULTS from a study of irrigation practices in the Pacific slope and drainage basin of the Pacific are published in Farmers' Bulletin 1518-F, entitled "Orchard Irrigation."

Selection of the site, according to the bulletin, is one of the most important factors in establishing a successful irrigated orchard. Success requires also the use of good land, the proper employment of irrigation water, care in the selection of trees and proper planting and cultivation until the trees begin to bear. The adaptability of the variety to the climate and soil, the volume and the kind of water supply, the height of the soil water table, the presence of alkali, the wages of labor and its quality, and the probable costs of harvesting and marketing the product are important considerations.

"Papa, what's a net?"

"A net, my son, is a bunch of holes tied together by little pieces of string. Now, put up your books and run out and play awhile."—*Okla. Whirlwind.*

Handling the Orchard Soil

(*Continued from page 4*)

a practice that was adopted without any extensive trials of applying it at other seasons of the year, the fact that it gave such satisfactory results established it in all sections. But certain pertinent questions have been raised during the past few years that require answering, such as the value of applying the fertilizer only after it is clear that a crop of fruit has set, that is, withholding it after winter injury or a spring frost has ruined the crop prospects. Or applying additional amounts during the middle to the latter part of summer when a heavy crop has set in order to increase the size of fruit as well as to secure a set of fruit buds for the following year. A still greater departure is the suggestion that the nitrogen be applied in the autumn rather than in the spring. Some work has been done on at least a part of these problems, although more is desirable.

Some results are reported from Illinois in which the "split" or divided applications were used with peaches. Some of these combinations are described as "excessive," yet no difference in "growth, leaf color or fruit bud hardiness could be seen." Both years in which this work was conducted were unusually dry, which would necessarily raise the question of whether the second treatment could enter the plants. The writer has been carrying on similar work for the past five years, and to date there is little if any difference between the plots receiving all the fertilizer in April and those that receive half of it in April and half about June 1. There is some suggestion, however, that the better trees are those which receive all of the fertilizer about two or three weeks before blossoming time. This same experience with peaches is also reported from Arkansas, all of which, taken together, raises a serious question whether divided applications are of any benefit. Furthermore, it must be kept in mind that they double the labor involved.

The idea that early applications increase the set of all kinds of fruit is pretty well known, but this point is of more importance in poorly nourished trees than those that are already in a good state of vigor.

The notion of applying readily soluble and hence quickly available materials like nitrate of soda and sulphate of ammonia in the autumn seems so unreasonable as to call for little consideration. The loss by leaching, the danger of winter injury, and the probable lack of results would deter most orchardists from trying it. Strange as it may seem to some readers, however, it is already an established practice in some sections, and favorable results are reported. In parts of the Northwest, where there is little or no rainfall after blossom time, it has become a rather common practice to apply these materials in autumn, and, we are told, the results are so definite and satisfactory as to warrant the practice.

Hooker of Missouri has reported that York apple trees are more regular in bearing from fall than from spring applications of nitrogen. The Maryland station has also shown that about as great a response in growth was obtained from fall as from spring treatments with nitrate of soda.

With both peach and apple at the Ohio station, we have obtained definite results from nitrate and sulphate applied in the fall, but the results are intermediate between the best of the spring treated trees and the check or unfertilized ones. However, in our case, the treatments were applied rather late, which would account for a reduction in results, since absorption diminishes as the temperature of the soil approaches 45 degrees Fahrenheit, or below. There may be a place for fall applications in our orchard program in the East, but there does not yet appear to be any outstanding advantage from its use, except for special cases.

As for not applying fertilizers during a year of frost or crop failure, it must be said of the soils with which the writer is working that it is always a mistake to make no applications whatever, as the untreated trees have been in poorer condition for cropping the following year than the treated ones. On richer soils in which the trees are very vigorous, the conditions are different, and at least a partial reduction can be made in such years.

Varying Requirements of Fruit Trees

A conception recently proposed by Bradford is that fruit trees may vary in the demand they make upon the soil at different periods of their growth. This theory would account for the observed fact that trees may make a vigorous growth and yet give no additional response to fertilizers at certain times but later in their life make a very definite response to such treatments. Growers have thought of this as a gradual exhaustion of the soil, at least in one of the essential elements, rather than as a change in the demands of the tree for certain forms of plant food.

Some Misleading Notions

Any innovation must win its way slowly and on its merits, and the use of nitrogenous fertilizers is no exception to the rule. While their value has been generally accepted and the discovery of them for orchard use represents one of the outstanding practical contributions that experiment stations have made, yet there are those who have grave misgivings regarding the wisdom of their continued use. We hear from time to time that these materials will ruin the soil, that they are stimulants only, that they are to the tree "what a drink of whisky is to a man," that they are "like whipping a horse," and many other such accusations. Now the trouble with such statements is that those making them deal in figures of speech, analogies, similes, etc., which are mostly fanciful and are not based on any experimental evidence. It must be granted that nitrogen does serve as a stimulant, but it is a direct and very necessary plant food material. We deceive more than we help ourselves by ignoring the large body of evidence on these matters and accept in its stead prejudice and products of the imagination.

Summary

In this article I have not attempted to assemble data to prove that fertilization of orchards is beneficial, for I believe that is evident to every unprejudiced observer or student of the question. I have preferred to mention some of the controversial or newer phases of the problem, a part of which, at least, cannot be considered settled at the present time. By way of summarizing these points as well as the generally accepted teachings, the following resume is given:

Nitrogen is the outstanding chemical element that is limiting in most American orchards, and by supplying it from almost any source, a definite response in growth and fruitfulness is secured. The degree of response depends largely upon the supply already available in the soil. The quickly available forms, such as nitrate of soda and sulphate of ammonia, give best results and these two materials are about equally efficient. The usual recommendation is to use one-quarter of a pound of nitrate of soda for each year of the tree's age, or about one-fifth less of sulphate of ammonia.

Phosphorus, in the form of acid phosphate, is frequently beneficial when applied between the tree rows at the rate of 250 to 300 pounds per acre to improve the growth of grass and clovers or to encourage the cover crop or intercrop grown.

Potash has not given a definite response in either growth of tree or in fruitfulness in most of the orchard experiments throughout the northern United States. There are occasional

(*Concluded on page 26*)

CHATS WITH FRUIT GROWER'S WIFE

By HAZEL BURSELL

Rejuvenating the Old House

WE HAVE just a few more words to say concerning the interior in this, the last of a series of articles on the rejuvenation of the old house. Then we'll be ready to consider the exterior.

Interior items left for discussion this month include the attic, sewing room, laundry room and fruit room. An attic, whether low ceiled or high, regular or irregular shaped, can be transformed into various useful and attractive rooms with but a small outlay of money. Attic bedrooms are always inviting and clever looking, especially when done in dainty sprigged wallpaper, gayly flowered cretonne or chintz drapes, rag rugs and four-poster beds, in the true Colonial manner. An attic bedroom may well be the boy's room, if executed in the style suggested in a previous article. Built-in window seats and built-in or movable desks are always attractive for the attic room. Be sure to provide a clothes closet with convenient shelves and hanger rod.

Sewing Room Needed

A light, airy sewing room is a necessity for the farm home. One part of the attic may be just the thing for this purpose. The room needs little furniture, a sewing machine and straight or swivel chair, a large oilcloth covered table to afford ample space for cutting, built-in or cupboard storage space for materials and garments in process of completion, and a small, armless, cushioned rocker being all that is necessary. A padded and cretonne-covered window seat with hinged lid would offer additional storage space, as well as add a pretty touch to the room.

The attic has come to be the great universal joke as a storage place, or rather the "catch-all" for thousands of dusty, useless articles cast off over a period of years. But this need not be the case. The space under the gables may be floored, and neat doors may be fitted to lead into it from the sewing room or stair hall. Then trunks and old chests may be arranged in the space thus provided in an orderly and convenient manner. Wide doors will be necessary to accommodate the trunks.

A great aid to convenient storage would be a series of cedar-lined and moth-proof drawers, of varying depths and lengths, built flush with the wall of the sewing room or bedroom so as to use part of the waste space under the gables. Some well-appointed homes have whole cedar-lined moth-proof closets with rods for garment hangers and shelves for blankets, wool quilts and so forth. Of course, as everyone knows, the articles to be stored must be absolutely free from moths or moth eggs when placed in the cedar closet.

No home is complete without a well-constructed, frost-proof basement for the storage of fruits and vegetables, the winter's fuel supply, water tanks, canned goods, and to provide a laundry room. The basement should be light, well-ventilated and dry.

Power Washer Pays

The laundry room should contain all needed equipment for washing, arranged in the most convenient manner possible, and it should contain *nothing* that does not pertain to laundering. Running hot and cold water, together with good drainage, is essential. By all means, provide a washing machine, and if at all possible, a power washing machine. It is safe to say that mother's life can be lengthened by many years through the use of a power washer alone. A detailed discussion of washroom equipment was given in this department in a previous issue of the magazine and cannot be repeated here.

The homemaker who takes pride in the perfection of her canning should be given the opportunity to enjoy to the full the satisfaction she gains from occasionally gazing at the results of her industry and skill. She can have this pleasure, and the whole family can have a chance to indulge in legitimate pride, if a proper fruit room is constructed. It need not be wide, but just large enough for one person to move easily between the tiers of shelves on either side. The walls should be double-constructed throughout and insulated with sawdust or building paper so as to maintain an even, cool temperature throughout summer and winter. The shelves should be securely put up and well braced to avoid any possible catastrophies when burdened with the weight of many jars of fruits and vegetables. They should be without front edge boards, so that they may be easily cleaned. The room should be dark at all times, save when lighted by electricity or flashlight. Electricity is ideal for this room. A small screened opening for ventilation is needed. It should have a hinged wooden door which may be closed during freezing weather.

The Exterior of the House

Now that we have finished with the interior of the house and are ready to discuss the rejuvenation of the exterior, we expect to hear a chorus of "You have the cart before the horse," or words to that effect, all because we talked about the inside of the house first and left the outside to the last, especially since we said in the first article of the series that the inside would take its cue as to finish and furnishings from the outside.

We had a reason for leaving the exterior to the last. Interior changes can best be made before the rush season of spring farming and, being indoors, the weather would have no effect, while the exterior refinishing can be done only in suitable weather, which comes quite late in some sections of the country. And the interior will still take its cue from the exterior because the changes we shall make will not affect the size, shape or general style of architecture of the house.

To begin with, nearly all old houses would be improved 100 per cent by one or more coats of paint. If your particular house has just had a new coat of paint, then you can pass this paragraph by. Large houses should be painted a good light color with little or no trim. This applies especially to large square houses, which look their best in snowy white with no trim. Small houses may be finished in almost any rather quiet color, and may have considerable trim in one of the new and attractive greens, oranges, blues or medium tans, depending on which color would best harmonize with the main wall paint.

You'll be gratifyingly surprised at the change for the better even a simple coat of paint will make. A well-kept old house may be much more attractive and inviting than a new house indifferently kept up.

Awnings Are Attractive

Now try a set of gayly striped awnings for the windows and porches on

the south or south and west sides of the house. The stripes should be in colors to harmonize with the paint on the house and should be fast in color to both sun and water. The awnings made with iron rods for a frame are very attractive. The extremely gay awnings are perhaps more suitable to the smaller house, while those in plain neutral colors with conventional, stenciled borders in blue, green or orange are best for the large rectangular shaped house.

This summer provide substantial porch or lawn chairs, painted orange, green or blue to match the other color touches on the exterior or in the awnings, and cushioned in gaily striped or figured crash or cretonne. Another attractive and comfortable feature for the hot summer months is a lawn seat with a handsomely striped canopy roof of canvas (to match the awnings if they are used). Hammocks of the old-fashioned type are decidedly comfortable and inviting when hung in a shady nook.

If the house is to be really livable during the summer months it should be equipped throughout with screens on all doors and windows. Screens should be neatly made, painted to harmonize with the house and hung on good hinges. Window screens are best when hung with top hinges. One screened-in back porch will be found a great boon to summer contentment, especially if it is large enough to accommodate a dining table, a three burner oil stove and a work table. Try it this summer if such a porch is available.

Another great convenience that may be provided at small cost is a built-in vegetable cupboard for the back porch. If put in some niche in the corner, it will not take up any needed space. Such a cupboard may be used to hold the daily or weekly supply of potatoes, fresh vegetables and fruits and thus make it much easier for the housekeeper to preserve order on the back porch.

Porch Boxes Pretty

Porch and window boxes filled with bright colored flowers will add much to the beauty of the home. They require good soil, plenty of water, especially in the dry season, and healthy plants. Nature will take care of the rest. And the owner, on seeing the results, will wonder how he or she ever got along without them in the past. Climbing, flowering vines add beauty through their color and perfume, and also afford shade and seclusion from the casual eye of the passerby. They may be clematis, wisteria, moonflowers, morning glories, flowering beans, honeysuckle, roses, or even climbing nasturtiums. The type of vine makes little difference, so long as it bears luxuriant foliage and a profusion of flowers. The perennial vines should be pruned and shaped carefully to give a well-kept appearance, and all types should be trained to climb in an orderly manner.

The lawn, flower gardens and trees have much to do with changing the house from just merely a house to a home, so we shall give them passing consideration in connection with the rejuvenation of the house.

There is little or no excuse for an old established place not being the proud possessor of some fine, stately shade trees. But if this has been neglected, the owner should plant some trees this very week. Future generations will bless him. Nothing can really take the place of such trees, but we can provide some quick-growing bushy shrubs to take away the barrenness till the trees attain some size.

Shrubs for the Front

Evergreen shrubs are best for the front of the house, as they give beauty in winter as well as in summer. A few zinnias, snapdragons or delphiniums among the shrubs will insure gay-colored flowers all summer long without detracting from the neatness of the shrubbery arrangement.

And neatness is the first essential in connection with lawns and flower beds. If the lawn has never been put in condition, the old sod should be completely turned under, the soil leveled and worked down fine and then sown to a good grass seed mixture. It should then be kept free from footprints or other disturbances until a firm sod is formed. Plenty of moisture is needed in starting a new lawn, and also in keeping up an old one. The grass should be kept trimmed well at all times, especially around buildings, walks and flower beds. Precise, neat borders and edges constitute half the charm of the flower bed, so this point should be kept in mind in beautifying the home.

A good fence of lattice, or woven wire, or even of pickets (with none missing and all in perfect order) is another essential for the good looking home, where fences are necessary at all. When of lattice or pickets, it should be painted regularly. A wall of natural stones around the lawn of an old-fashioned house gives a pleasing appearance. A fence or wall serves as an ideal background for flowers and shrubbery. To complete the picture, the entrance to the yard should be through an easy-swinging gate, possibly with a vineclad arch over it. Can't you just picture it?

Cost Is Small

We have seen in this article and in the three preceding ones how we might greatly freshen and beautify the homes in which we live, largely through the application of paints, enamels and fresh wallpapers, by rearranging and refinishing the furniture already owned, by adding a few suitable accessories, and by hanging new curtains and drapes. We have given suggestions by which the houses could be literally transformed, at small expense as far as money is concerned, through careful planning and execution down to the last detail.

We may not have the time or money for materials for a complete transformation this season, but we can plan the work and accomplish all possible for the present, then do over one room at a time as means are available in the future. In the end, we shall have a truly delightful home.

And let us not forget that a riot of luxuriously growing flowers and vines can transform even the plainest, unpainted cabin into a bower of beauty!

Recipes for Summer Salads

WITH the coming of warm weather, human appetites crave cooling foods and drinks, and it is right that they should have them. Iced fruit beverages, frozen desserts, quantities of fresh fruits, and crisp salads of vegetables, fruits and greens have come to be an integral part of summer. Here are some recipes for appetizing salads:

Tomato–Cucumber Salad

Peel a crisp cucumber. Slice in rings and let slices stand in vinegar, seasoned with salt and pepper, for 15 minutes. Peel tomatoes, slice and arrange on a bed of lettuce. Arrange cucumber slices over the tomatoes, but do not cover them. A bit of finely chopped onion will add a delightful zest to the salad. Serve with a favourite dressing and a garnish of tiny red radishes and paprika.

Asparagus Salad

Tie fresh asparagus tips in groups of six, drop into boiling salted water and simmer till tender but still whole. Lift out carefully and drain. Arrange on bed of lettuce with a band of pimento or sweet red pepper around the center. Serve with mayonnaise or boiled dressing. Drained, canned asparagus may be used equally well.

String Bean Salad

Select tender stringless beans and cook until tender, but whole, in boiling salted water. Drain, allowing two or three cups for six servings. Marinate (cover and let stand for some time with a good French dressing). Mix in one teaspoon of finely cut onion. Pile in center of salad dish and arrange around base thin slices of radishes overlapping one another. Garnish top with a radish cut to represent a tulip. Tomatoes (small size) may be used in place of radishes around the salad.

Lettuce–Radish Salad

Prepare a head of crisp lettuce by discarding outer leaves, removing crisp leaves from center stalk, and washing the leaves. Hang in a bag or lay on a towel to dry. Then arrange lettuce in a bowl in the way it came in the head originally. Place between the leaves six red radishes which have been washed, scraped and cut in thin slices. Garnish with round red radishes cut in the form of tulips. Serve with a good French dressing, put on just before serving. Tomato or cucumber slices may be used in much the same manner in this salad. A bit of grated onion might be sprinkled in here and there.

Stuffed Tomato Salad

Cut a slice from the smooth end of a ripe tomato for each service. Scoop out the inside pulp and save for salad filling. Cut celery, cucumbers, radishes and tomato pulp into small pieces. Mix lightly with French dressing and heap into prepared tomatoes. A bit of onion may be used. Tiny cubes of American cheese and chopped sweet pickles are also excellent in this combination. Finely shredded cabbage may be used in place of celery.

Pear Salad

Either fresh or canned pears may be used for this salad. Canned pears should be drained and arranged in nests of lettuce on a large salad plate. Fresh pears should be wiped, pared and cut in halves. Then remove the seeds and arrange as the canned pears. Fill the centers with grated sharp American cheese. Garnish with ribbons of pimento, bits of Maraschino cherry, a slice of stuffed green olive, or a dash of paprika. Serve with mayonnaise or French dressing.

Cabbage-Pineapple Salad

Mix equal parts of grated pineapple and finely shredded, crisp cabbage. Moisten with boiled dressing or mayonnaise, as preferred.

Cherry–Nut Salad

Wipe fresh or drain canned cherries. Remove stones and fill cavities with pecan nut meats. Arrange on a bed of crisp lettuce leaves and garnish with cherries from which the stems have not been removed. A canned, drained prune stuffed with cottage cheese makes a pretty center for the cherry salad.

Tomato Jelly

3 c. tomato juice and pulp
2 T. gelatin
1 t. salt
6 cloves
4 t. onion
Syrup of parsley

Swell gelatin in ½ c. tomato juice. Boil remainder of tomato juice with clove, onion and salt for one minute. Remove from heat, add swollen gelatin and stir until dissolved. Put parsley in wet mould and strain tomato juice over it. Chill until firm. Unmould on lettuce leaf and serve with mayonnaise. Any desired vegetables, such as celery, beans, peas or cabbage, or nuts may be moulded into the tomato juice in place of the parsley.

Table of Abbreviations

1 t. equals 1 teaspoonful.
1 T. equals 1 tablespoonful.
1 c. equals 1 cupful.
All measures level.

Canning Methods for Acid and Non-Acid Vegetables

THE BUREAU of Home Economics of the United States Department of Agriculture is frequently asked why the water-bath method of processing may be used in the home canning of fruits and tomatoes, whereas non-acid vegetables must be processed under pressure.

The explanation given is that for successful canning the temperature applied should ordinarily be the lowest possible that will insure a safe product. While no growing, or so-called vegetative, bacteria will survive for any length of time at the temperature of boiling water (212 degrees Fahrenheit), some bacteria are able to go into spore form. These spores are killed only by very long-continued heating at boiling temperature, especially if the fruit or vegetable being canned has juice that is alkaline or only very slightly acid. When the juices are acid, as in fruits and tomatoes, all forms of bacteria are killed more quickly at 212 degrees Fahrenheit, which is the highest temperature possible in the water bath. A water-bath canner is commonly understood to be any covered vessel of sufficient depth for the jars or cans to be completely immersed while processing, and equipped with a rack or false bottom which permits water to circulate around the jars or cans. A wash boiler frequently answers the purpose in the household.

Corn, peas, beans and other vegetables that do not have acid juice need to be processed under steam pressure at temperatures higher than 212 degrees Fahrenheit, and for this reason the steam-pressure canner is recommended for canning them.

No. 2908—Youthful Model.
Cuts in sizes 36, 38, 40, 42, 44 and 46 inches bust measure. Size 36 requires 3½ yards of 40-inch material with ⅝ yard of 27-inch contrasting.

No. 2848—Slender Lines.
Cuts in sizes 18 years, 36, 38, 40, 42, 44 and 46 inches bust measure. Size 36 requires 3⅝ yards of 40-inch material.

No. 2806—Long-Waisted Dress.
Cuts in sizes 16 and 18 years, 36, 38, 40, 42 and 44 inches bust measure. Size 36 requires 3½ yards of 36-inch material.

No. 2901—Novel Waistline.
Cuts in sizes 6, 8, 10, 12 and 14 years. Size 8 requires 1¾ yards of 40-inch material with ½ yard of 27-inch contrasting.

No. 3010—Delightfully Girlish.
Cuts in sizes 6, 8, 10, 12 and 14 years. The 8-year size requires 1⅞ yards of 32 or 36-inch material with ¾ yard of 36-inch contrasting.

No. 3042—Tremendously Smart.
Cuts in sizes 16 and 18 years, 36, 38, 40, 42 and 44 inches bust measure. Size 36 requires 2⅞ yards of 40-inch material with ⅝ yard of 32-inch contrasting.

No. 2741—For the Smart Matron.
Cuts in sizes 36, 38, 40, 42, 44 and 46 inches bust measure. Size 36 requires 3 yards of 40-inch material with 1½ yards of 20-inch contrasting.

No. 3024—Youthful Interpretation.
Cuts in sizes 14, 16 and 18 years, 36, 38 and 40 inches bust measure. Size 36 requires 4¾ yards of 40-inch material.

No. 3036—Morning, Sports, or Porch Dress.
Cuts in sizes 16 and 18 years, 36, 38, 40, 42 and 44 inches bust measure. Size 36 requires 3½ yards of 36-inch material with ⅝ yard of 32-inch contrasting.

No. 2959—Bloomer Dress.
Cuts in sizes 2, 4, 6 and 8 years. The 4-year size requires 2⅝ yards of 36-inch material with ⅝ yard of 18-inch contrasting and 2 yards of binding.

No. 2932—Reversible Fronts.
Cuts in sizes 16 and 18 years, 36, 38, 40, 42 and 44 inches bust measure. Size 36 requires 3¾ yards of 36-inch material with 7 yards of binding.

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Summary of Fruit Prospects

(Continued from page 8)

fruits are in fairly good condition and were not seriously injured by the freeze.—*T. J. Talbert.*

Arkansas (May 10).—The strawberry season is about at its peak, and we are having about a 50 per cent crop. The damage to apples from the last two freezes was greater than at first anticipated. The apple crop in northwest Arkansas will not run over 40 to 50 per cent. The amount of recovery due to growth from secondary buds and latent buds is problematical but will certainly not be over 25 per cent.

Raspberries and blackberries are apparently uninjured. The cherry crop shows heavy damage; there will not be over 25 per cent of a crop at best. Peaches in the regular peach section have escaped further injury and there is still 50 to 60 per cent of a crop in prospect. Plums and cherries were not injured even in northwest Arkansas by the last freeze, all the damage having been done by the earlier one. A reduced fruit crop is in prospect. Growers should give their orchards the best of care.—*J. R. Cooper.*

Tennessee (May 7).—The bad weather of March and April has played havoc with the fruit prospects in Tennessee. Peaches in commercial districts have been 85 per cent killed. The small percentage left is not developing very satisfactorily. The apple crop is very scattered. Many orchards will bear no crop at all, but the better orchards will have approximately 20 per cent of a normal production. Grapes were completely killed in most sections by the heavy frost and freeze which occurred on April 22 and 23. Strawberries are now moving in large volume from Tennessee, and the peak will probably be reached some time during the coming week. The outlook for the fruit crop in Tennessee is less favorable than it has been in any year since 1923, when our fruit crop was practically a complete failure.—*J. L. Baskin.*

Georgia (May 6).—The Georgia peach season should begin this year with the movement of Mayflowers some time during the week of May 16 to 21. The crop of early varieties will be lighter than that of last year. The crop of Hileys will also be lighter apparently. A good crop of Elbertas and Georgia Belles is in prospect. These two varieties may equal last year's production. The bulk of the Georgia crop this season will be produced within 50 or 60 miles of Fort Valley. Unofficial estimates are placing the crop around 15,000 cars. A rather heavy infestation of curculio has occurred since my last report. Although growers immediately took steps to control the pest, considerable damage may show up by harvest time. The peach season should be ended at Fort Valley by July 15 this year.—*O. I. Snapp.*

Florida May 1).—Crops are showing a low condition due to continued dry weather. Condition of oranges is reported at 68 per cent of normal as compared with 93 per cent in 1926, grapefruit at 64 per cent compared with 90 per cent, and tangerines at 66 per cent compared with 88 per cent in 1926. Satsuma oranges in west Florida are reported at 65 per cent compared with 85 per cent last year. Peaches show a condition of 56 per cent compared with 73 per cent a year ago. The storm damage last year is responsible for the low condition in part but the main cause is present dry weather, and the situation may be changed materially with the coming of rain.—*H. A. Marks. United States Department of Agriculture, Orlando.*

Texas (May 7).—Damage from the March freeze proved to be more severe than was expected a month ago. In addition, the frosts in April, accompanied by high wind, hail and excessive rains, have reduced prospects to about a third of a peach crop for this season. On account of heavy rains, spraying has been largely ineffective. Apples, pears and plums have fared somewhat better, and blackberry and dewberry crops are in fair to good condition. Additional fruit trees have been planted to an extent that will about offset those lost during the year —*H. H. Schutz.*

Washington, Yakima Valley (May 7).—We had two heavy frosts here April 19 and 20. The damage to soft fruits was very heavy, and at the time we thought the apples were badly injured. However, a second bloom has come out on a great many trees which apparently had suffered severe damage, and it now looks as though the apple crop is hurt very little.

My estimates for the season's shipments are as follows:

	Cars.
Apples	12,000
Apricots	25
Cherries	50
Grapes	150
Melons and cantaloups	300
Mixed fruit	1,000
Peaches	300
Pears	3,000
Prunes and plums	150
	16,975

—*Luke Powell.*

Washington, North Central Part (May 9).—One of the most severe spring freezes ever experienced visited this section just as the apricots were finishing blooming and as the cherries were coming into full bloom, causing a damage of about 50 per cent to both.

Some damage is reported to certain varieties of apples. Delicious may be reduced by 10 to 15 per cent. Slight damage has been done to Jonathans, but with the exception of a few spots, the other varieties of apples have not been affected.

Bartlett pear bloom is heavier than earlier reports indicated and a normal crop is in prospect. Other pears are blooming profusely and have suffered practically no frost damage.

Peach bloom was very light on account of injury to buds during the winter, and there will be few peaches in the Wenatchee district.—*J. H. Auvil.*

Oregon (May 9).—There was rather severe winter damage to red raspberries, peaches and sweet cherries in some sections, and this will undoubtedly cause reduced production. Prunes yielded heavily last year, and a light crop is in prospect this season. Pears are expected to yield well in most sections. The apple crop will probably run from 50 to 60 per cent of the tonnage of last year. The late spring has caused poor pollination in some cases.

There has been a little planting of cherries and pears and a rather heavy planting of strawberries in some sections. Some of the larger strawberry growers are becoming uneasy over this heavy planting because the prices have been especially good during the last three years and there is a likelihood of an over-stimulation of planting as a result.—*W. S. Brown.*

California (April 28).—Following the heavy crop of last season, almonds seem to have set a lighter crop this year. Apricots promised well early in the season, but green rot has seriously reduced the crop in some sections. Canning peaches seem to have set lighter than last year. Thinning of peaches is now under way. Reports indicate many doubles in the Tuscan variety, which will give trouble in thinning. It is rather early to estimate the prune crop, but present indications point to a fairly heavy crop. Late frosts in scattered localities did considerable damage to various deciduous fruits.—*A. H. Hendrickson.*

California (April 29).—Considerable damage from frost occurred in Merced county in the San Joaquin Valley on April 17. This affected the Kadota, Adriatic and Black Mission figs rather seriously, the new growth having developed far enough to be injured by the low temperature reached, which was around 28 or 29 degrees. As a result, the Kadota crop will be two to three weeks later, and the tonnage from the young trees will probably be reduced.—*I. J. Condit.*

Rambles of a Horticulturist

(Continued from page 5)

is the only fungous or insect enemy of importance. This disease can be readily controlled by spraying with 5-5-50 Bordeaux mixture at 30-day intervals, beginning when the rust appears, according to Prof. Lanham.

Trees Heavily Cut Back Each Year

The pruning of the Magnolia fig is quite simple. The cue for this type of pruning was taken many years ago from a freeze that killed the trees to the ground. Many thought that the industry was doomed and grubbed out their trees immediately. However, the crowns produced shoots and developed new tops that bore as well as ever. Now, it is a common and general practice to cut back the trees almost to the crown every year. About four nodes of the previous year's growth are left, as a rule. No leader is allowed to develop. The trees are usually frozen down every few years in addition. The figs develop in the axils of the leaves on the new wood. They begin to form as soon as the branches reach a fair size and continue for some time to set in the more newly developed growth. The crop ripens from August to November, beginning on the lower branches. During the height of the season, two or three pickings a day are often made in order to catch the fruit at the right stage. A considerable quantity of fruit is shipped to nearby markets in the fresh condition, but most of the crop is preserved. The figs are first dipped in lye solution to remove the fuzz and soften the skin. They are then rinsed in clear water and cooked. None of the Magnolia figs are dried.

Marketing Is the Chief Problem

The great problem of the industry is marketing. Production has outgrown the demand, at least under present marketing methods. There is no co-operative organization in the district. In 1926, 9,000,000 pounds of figs went to waste. Although a large part of the crop was contracted for by private interests, many of the buyers simply refused to take the product. In 1926, there were 17 private preserving plants in the district. Several of these are of very ordinary type, and none can be called a truly modern and highly efficient plant. One trouble in the past has been the lack of uniformity in color and appearance of the product after being processed. Mr. Clymer, who took me through the district, is organizing a new company which he claims will have a modern plant at Houston that will be capable of handling the product in a way that will assist in developing the industry to the advantage of all concerned.

Besides figs, large quantities of strawberries, blackberries and dewberries and some Satsuma oranges are grown. Cotton and general farm crops are, of course, grown in abundance.

Galveston and Corpus Christi

We took a side trip by trolley to Galveston. The seven-mile sea wall now in place is amply strong to protect the city against any storm damage in the future. The government has spent about $20,000,000 in developing an immense harbor. The city is second in the United States in the exports handled and leads the ports of the world in the exportation of cotton. Over 3,000,000 bales are handled a year on the average, as well as large quantities of other products. Four railways serve this city.

We next stopped at Corpus Christi, which is a live, growing city. The most interesting thing is the great new harbor which has now been in operation for several months. This port has great possibilities for industrial and business development.

At Kingsville, we visited the famous King ranch, which was established in 1854 by Captain Richard King. The ranch consists of 1,200,000 acres, located in nine counties. Robert Kleberg, the present manager and one of the six heirs of the property, entertained us at a barbecue. There are now about 75,000 head of cattle on the place, consisting of Shorthorns, Herefords and cross breeds between the domestic breeds and the Brahma or sacred cow of India. There is also a very fine herd of Jerseys on the place. Cotton and other farm products are grown extensively.

The Lower Rio Grande Valley

We arrived at Harlingen in the lower Rio Grande Valley on the morning of March 25. This valley embraces parts of four counties and is the most southern agricultural area in the mainland of the United States. The valley extends east and west along the north side of the Rio Grande. It is about 50 miles wide at the coast and narrows to a point about 100 miles from the coast at Rio Grande City.

We took a long auto trip up the valley, stopping at Mission and Edinburg and returning to Brownsville by way of San Benito and Olito. This whole section is fairly alive with activity. A large assortment of crops is grown, including vegetables of all kinds, which are marketed throughout the winter. In the fruit line, citrus fruits are of most importance. Oranges and lemons are grown to some extent but do not offer great

Near view of banana unloading machinery. The large booms are lowered into the hold of the ship, and the bunches of bananas are brought out on the canvas pockets of the endless belt that runs through the booms

promise in competition with the fruit of Florida and California. The grapefruit, however, offers great promise, and it is this branch of citrus culture which is growing fast. The first carlot shipments were made in 1921-22. In 1925-26 the shipments were 231 cars and in 1926-27, 870 cars. The plantings now consist of about 60,000 acres and number 4,000,000 trees, about 20 to 25 per cent of which are in bearing. It is estimated that in 1930, 75 per cent of the trees will be in bearing and the shipments will reach 15,000 cars. Just how the country will be able to use all of this grapefruit is a very serious question indeed.

The Rio Grande Valley receives a rainfall of 26 to 28 inches a year. Many crops are grown to a fair degree of success without irrigation, but for real success, especially with citrus fruits, irrigation is necessary. One application of water is sufficient in many seasons, but two are often necessary. This was the case the past season. For citrus fruits the irrigation is completed in October so as to give the fruit a good finish before cold weather arrives.

Water Obtained from Rio Grande

The water for irrigation is pumped from the Rio Grande. There are now 12 large projects in operation in the valley and a number of small ones. The larger systems involve 500,000 acres, of which 430,000 are in cultivation. There are about 350,000 acres more which are capable of cultivation, it is said, and judging from the real estate activities, these will soon be developed. On the 12 large systems, 2000 miles of main ditches carry the water to the farms. Ten of these large systems are owned by the growers by virtue of the Texas laws, under which they assess and collect taxes and rates and have in a sense a government within a government. The remaining two projects are privately owned. One of these, the American Rio Grande Land and Irrigation Company, has 100,000 acres within its boundaries, and more than 90,000 under irrigation. It operates a 4000 acre experiment farm. It grows trees for its own needs and has sold 500,000 in addition.

The soil of the valley is sandy loam and fairly uniform in type. The land is almost level or slightly rolling. Practically no fertilizer has been used to date. Garden beans are grown between the trees in some groves, but most growers feel that no fertilizing is necessary. This viewpoint will no doubt be changed in time.

Varieties and Cultural Methods

The Duncan, Marsh Seedless and Conner's Prolific grapefruit are the varieties chiefly grown. The Foster Pink is as yet a novelty, but its fruit is large on the average and its quality and appearance are first-class, although it has seeds. This variety undoubtedly has a future before it.

Most of the trees are grown in Texas, due to the rigid quarantine laws. Trees often bear a few fruits in their first and second years. The first commercial crop is produced in about the fifth year. A good bearing tree should produce four to five boxes. Rust mite and scale are the principal enemies, and most growers spray twice a year.

The grapefruit grows extremely well in this district. One of the groves we visited was that of George A. Morrison of Mercedes, Texas. His seven-year-old Conner's Prolific trees showed exceptional vigor and were heavily laden with fruit, although it was well beyond the normal picking time. The normal marketing season is from December to March, but Mr. Morrison allowed his fruit to remain on the trees in the hope of getting better prices, and according to his own statement, he was reaping a profit because of the delay.

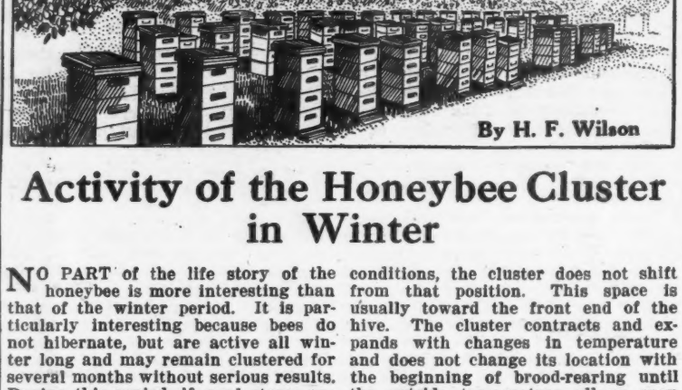
The industry is not very well organized as yet, but a good start is being made under the Texas Citrus Growers' Exchange, whose headquarters are at Mission. John H. Shary, who has been developing considerable land in the section, has been quite active in the promotion of the exchange. Co-operative marketing should by all means have the support of every grower in the district, for it is only by the use of organized methods of merchandising that the tremendous production of the future can be marketed successfully, if at all.

Radio a Valuable Help

THE RADIO is proving a valuable aid in the corn borer control campaign being conducted in the five states involved. In Michigan, a radio report is made after the holding of each county demonstration. Many farmers have by this means received their first information as to clean-up and regulations for the control of the pest.

Recently a farmer asked to have a demonstration staged on his farm. Later his farm was selected. The schedule was announced over the radio, and the next morning the county agent advised the farmer that his farm had been chosen. However, the farmer had already heard the news over the radio, and his farm was posted and signs had been put up in the surrounding territory.

Bee Keeping for Fruit Growers



By H. F. Wilson

Activity of the Honeybee Cluster in Winter

NO PART of the life story of the honeybee is more interesting than that of the winter period. It is particularly interesting because bees do not hibernate, but are active all winter long and may remain clustered for several months without serious results. During this period, if good stores are present, the cluster is influenced only by changes in temperature. Their reaction to temperatures is quite constant, but the size and conditions of individual colonies varies to such an extent that different temperature values appear to exist.

A bulletin on the study of "The Winter Protection for the Honeybee Colony" has been published by the University of Wisconsin, and a copy may be secured by writing to the Department of Economic Entomology, University of Wisconsin, Madison. One of the important phases of this bulletin deals with the honeybee cluster, and the observations will be important to all beekeepers whether they have few or many colonies. A summary of the observations follows:

These observations and data show quite clearly that bees may begin to gather toward the clustering space when temperatures outside the hive drop below 65 degrees Fahrenheit. Below 55 degrees Fahrenheit a very definite cluster is formed, although all of the bees may not join the cluster until lower temperatures are reached. If the temperature is lowered very rapidly when the bees are scattered about the hive, one large and several small clusters may be formed. Gradually the bees in the smaller clusters break away and join the main cluster. At first the cluster is very loose, but it becomes more compact as the temperature rises. At 50 degrees Fahrenheit outside the hive, many bees will remain free from the cluster, resting on the combs without any apparent motion, but as the temperature gets lower, toward 25 to 30 degrees Fahrenheit, the individual bees begin to move about and gather in groups of half a dozen or more. If unsealed stores are available, they begin scrambling for food. These little groups shift about more or less and gradually break up, the individual bees joining the main cluster. If the temperature remains uniform, these smaller clusters will remain separate for a long time when food is available. Very active feeding also begins with the gathering of the cluster, similar to that of filling the honey stomach with stores when the colony is otherwise disturbed. Individual bees and even small groups too far from the cluster apparently are unable to withstand the cold and die in their resting place when extremely low temperatures occur.

Very often bees clinging to the edges of the cluster become chilled and in observation hives have been observed to drop away from the cluster. These observations would indicate that bees in unprotected hives or with no more packing or insulation than that provided by the double walled hive are often exposed to extremely cold temperatures which cannot help but lower their vitality and decrease their value to the colony in its organized existence.

Bees Form Clustering Space Before Winter

Each colony prepares a clustering space before winter, and under normal conditions, the cluster does not shift from that position. This space is usually toward the front end of the hive. The cluster contracts and expands with changes in temperature and does not change its location with the beginning of brood-rearing until the outside temperature allows easy expansion.

Winter Cluster as Protected by Outside Layer

On the edge of the cluster there are groups or layers of bees that remain perfectly quiet with the wings slightly raised and at about a 45 degree angle. Inside the cluster some of the bees are active and may be seen moving about without any apparent purpose in mind. Some of the bees remain in a still position but vibrate their wings quite rapidly. A third group may be seen shifting the body from side to side in a sort of "waltz" movement. This movement seems to be more rapid at times than at others.

Disturbances Cause Increase in Activity

Any disturbance causes an immediate increase in the activity of the cluster and a corresponding rise in temperature. The rise in temperature is proportionate to the nature and extent of the disturbance and may produce a rise of 10 degrees or more in the center and 40 or more degrees in the edge of the cluster. If the first disturbance is extensive and the hive temperature increases rapidly several degrees, it may continue to rise still higher but more slowly during a period of at least 18 hours in individual cases that have been observed. On March 2, 1923, when the temperature outside the hive rose to 57 degrees Fahrenheit the cluster temperature of a colony without packing rose to 94.5 degrees Fahrenheit. Simply removing the cover of a normal colony during the winter period will cause the temperature of the cluster to rise four or five degrees.

As the temperature outside the cluster becomes lower, the temperature within the cluster becomes higher up to a variable limit. When the temperature outside the cluster rises, the temperature within the cluster becomes lower again to a variable limit. However, the cluster temperature does not always rise to the same high point, and if the temperature outside the cluster is extremely low, the high point of the cluster is also low. This indicates that sometimes when the temperatures are below certain points, some colonies are not able to keep up the temperature within the cluster.

Temperatures in the Cluster Vary Greatly

The average temperature of the cluster is relatively low at the beginning of the winter period but gradually becomes higher as the period of confinement lengthens. After a good cleansing flight is possible, the average temperature becomes lower. This does not hold true if brood-rearing is started, since the temperatures then remain more or less uniform near 90 degrees Fahrenheit or above.

The highest temperature in the cluster does not always remain at the same spot, but shifts within the cluster without any apparent regularity. (This may be due to feeding.)

The temperature of the cluster is not constant at any one point and the average may vary greatly from day to day regardless of outside temperatures. There are always a number of points in the main part of the cluster that are somewhat equal in temperature, but the temperatures in the edge or shell of the cluster vary greatly. Usually, they are high with high outside temperatures and low with low outside temperatures.

It also seems best to define the shell of the cluster as forming a band of temperatures. The temperature in this band may vary as much as 15 to 20 degrees Fahrenheit. As bees have been observed clustered over thermometers reading as low as 40 degrees Fahrenheit at 15 degrees Fahrenheit outside, it may safely be concluded that temperatures in the edge of the cluster fall even below 40 degrees Fahrenheit at times.

Fruit and Vegetable Program of American Institute of Co-operation

AS ANNOUNCED in previous issues, the third summer session of the American Institute of Co-operation will be held at Northwestern University, Chicago, Ill., on June 20 to July 16, inclusive. The two previous summer sessions, held at Philadelphia, Pa., and St. Paul, Minn., proved a great success and the forthcoming session promises to be fully as successful. Many prominent authorities from all parts of the country, as well as a number from foreign countries, will address the institute and conduct classes on subjects of importance in co-operative marketing and agricultural economics.

The week of July 11-16, inclusive, will be devoted primarily to fruit and vegetable marketing and related problems. A detailed program for this part of the course will be presented in the July issue.

The sessions of the institute will be open to all persons interested in co-operation and who pay the fee of $15 for the four weeks, or $5 per week, or $1 for daily attendance. Payment of the fees entitles students to attend all sessions and to take part in the discussions. Those who have attended the past sessions report great satisfaction from the instruction given.

Peach Thinning Increases Size but Does not Decrease Volume

J. A. HOLDEN, owner and manager of the Paul Rose Orchards, Mitchell, Ind., gives an interesting account in *Hoosier Horticulture* of his experience in thining peaches. An eight-year-old tree on which the peaches were thinned to seven inches apart yielded 10.4 bushels containing 1780 peaches. An adjacent tree, left unthinned, produced 10.5 bushels, with a total of 2416 fruits. Thinning in this case increased the size and did not materially decrease the volume of the crop.

There are 2800 bearing trees in the Rose orchards. The trees have been variously pruned, and the average height is about that of a normal eight-year-old tree. The thinning crew averaged about 18 men. It required on the average three-quarters of an hour to thin each tree. An average of 800 peaches was removed per tree. The total cost of the thinning, including the foreman's time and that of two regular hands, was $676.70, or slightly over 24 cents per tree.

The thinning is done as early as possible so as to direct the energy toward the development of the remaining fruit. The best results will follow, according to Mr. Holden, when the thinning is done as soon as it can be determined definitely what fruit will "stick" and what will come off in the June drop.

In sections of the country where frost damage has occurred, little or no thinning may be necessary, but growers who have been fortunate enough to escape frost damage will find it to their advantage to thin their fruit carefully.

Engineering for the Fruit Grower

By E. W. Lehmann

Hot Water for Summer Use

PROVIDING an abundant supply of hot water for use during the summer months is more often a problem than to provide a hot water supply during the winter. With water under pressure and the house heated by a furnace, it is an easy matter to install a hot water coil in the fire box and get an ample supply of hot water. The hot water front on a coal range makes an easy way to have hot water during the winter.

When summer comes and the fire in the furnace is allowed to die down and a kerosene stove is substituted for the coal or wood range, then some other means of heating water must be resorted to. In my own home in the country, this problem is solved by the use of a coal burning hot water heater. This heater is built with a water chamber around the fire pot. It also has a two-hole top on which a wash boiler may be placed for boiling clothes or for canning purposes.

Another type of hot water heater that is finding favor in the country is the kerosene heater. The kerosene burner is a practical, safe and economical method of heating water. It can be connected to an ordinary hot water tank the same as any gas heater. A distinct advantage of the kerosene heater over other types is that the fuel is easily obtained.

When electric power is available from a power line, an electric heater may be used. Unless the heating rate is very low, the cost of heating water by electricity is prohibitive.

The Mower May Need Attention

THE MOWER is a common implement on the farm and is a wonderful labor saver, but it is often neglected and is in a bad state of repair when taken into the field. If it is to operate efficiently, it must be kept in good working condition. A. L. Young of the Department of Farm Mechanics, Illinois College of Agriculture, makes the following timely suggestions on servicing a mower, which might well be remembered by everyone who operates a mower this season.

"Several things are necessary for a good job of cutting. The sickle must, of course, be reasonably sharp and the ledger plates not too badly worn. Each section of the sickle not only should be held near the ledger plates over which it slides, but also should be held approximately parallel to those plates. This means (1) a straight sickle and cutter bar with all guards in line; (2) wearing plates that hold the rear edge of the sickle up where it is supposed to be held; (3) clips bent down so as to hold the sections where they belong; and (4) with the sickle at either end of its stroke, the center of each section should be over the center of a guard.

"The dividing boards or rods at the ends of the cutter bar must, of course, be kept in the right position. For satisfactory operation, it also is important that there be as little lost motion as possible between drive wheels and sickle. This may mean, among other things, renewal of the dogs in the main drive wheels.

"For light draft, the sickle and pitman should operate in approximately the same line and at a right angle to the crank shaft which operates the pitman. Well lubricated and properly adjusted bearings will, of course, help in lightening the draft. Also, the heavy spring which aids in lifting the cutter bar should be adjusted so as to allow shoes at either end of the bar to drag only lightly on the ground.

"Keeping everything tight and replacing worn parts before they are near the breaking point will go much toward helping avoid breakdowns and costly delays. Undue looseness at either end of the pitman, including the sickle head guide and the crank shaft bearing nearest the pitman, means rapid wear.

"Anything that will make the mower operate better will add to its durability. Prevention of rust with paint and grease and housing the machine when it is not in use, are important but probably not so much as keeping the machine in good order when it is being used."

Hydraulic Rams for Pumping

WHEN the right conditions exist, the hydraulic ram is a satisfactory low cost type of pumping equipment. It can seldom be used in the prairie sections of the country, but in rolling and hilly sections where a great many springs abound, the possibilities for its use are very great.

If you have a flowing spring of a reasonable capacity that is located some distance below the house, the point to which it is desired to deliver the water, don't just buy an hydraulic ram, but buy one for the particular conditions. The size of the ram that can be used satisfactorily is governed by the flow of the spring or other source of supply and the amount desired at the point of delivery.

I was once told by a farmer that he had an hydraulic ram, but that it wouldn't work. Upon inquiry, I found that the ram that didn't work was one bought at a farm sale. The reason it didn't work was because it was designed to be used under conditions quite different from those under which the new owner was trying to use it.

In selecting a ram, always determine ahead of time the average flow of the spring or other source of supply, also the available fall to a point where the ram might be located, where the waste water may be discharged without any backing over the waste valve. In addition to determining the quantity of flow and the fall, also determine the height to which the water is to be delivered and the amount to be delivered in an hour. With this information, the proper size can be easily selected by the manufacturer.

Ordinarily a ram will lift only one-tenth to one-seventh of the water flowing through the drive pipe. An easy rule for estimating the water that can be lifted is as follows: multiply the quantity in gallons of water flowing per minute by the number of feet of vertical drop to the ram; divide the product by the height to which water is to be delivered above the ram; and reduce this by one-third for an estimate of the amount of water pumped. As an example: if the flow from a spring is six gallons a minute, the fall to the ram is five feet and the height to be delivered is 30 feet; then the amount of water delivered would be six times five, or 30; this divided by 30 equals one. One minus one-third of one equals two-thirds of a gallon a minute, which would be equivalent to 40 gallons an hour, or nearly 1000 gallons a day, which would be an ample supply for the average farm.

A Question About Light Plants

"I AM CONSIDERING a light plant for farm use and would appreciate very much some information on the subject. Are these plants practical and serviceable? Are plants with batteries better than those without?" These questions have been asked by an Illinois farmer. No doubt there are others who want information on the same points. I will therefore attempt to answer them.

There are thousands of small unit electric plants in use on farms. They have long since passed the experimental stage; they are serviceable, practical, and have brought into many farm homes better lighting and the joys that go with it.

It is my opinion that there is a place for the small unit electric plant on many farms that cannot now be served from power lines. Where a power line extension can be made to the farm, without great expense, there is little question but that it is a better source of electricity, because there are possibilities then for both power and light. When the interest on the investment and the depreciation of a small unit plant are considered, the cost per unit of energy is quite high. Many farmers who are using only 10 to 20 kilowatt hours of electric energy are paying as much as 60 cents per kilowatt hour in the first case and 40 cents in the second. Whether the small unit electric plant is practical for the individual farmer depends on whether he is willing and is financially able to pay the price. The man who uses more energy will find the cost greatly reduced per kilowatt hour.

As to whether the plant with batteries is better than a plant without depends on the use. We might answer the question by asking which is better, a race horse or a draft horse. The race horse is best for one purpose and the draft horse is best for another. So it is with the battery plant and the plant that is entirely automatic.

If the load is to be quite constant, and fairly large, then the automatic plant without battery would be quite satisfactory. However, if you do not care to use more than one or two lights at a time, and there is a possibility of only one light being used quite a little at night, then the battery plant would be more desirable. This can be readily understood when it is realized that the non-battery plant is started and runs continuously even though only one light is in use. There is no question but that the non-battery plant has more things to get out of order than the battery type. However, the depreciation on the battery is rather high, and it is a large item in the cost of operating the battery type plant.

My suggestion on purchasing a small light plant is to consider the status of the manufacturer, also the local representative. Be sure the local dealer is in a position to render service before you purchase a plant from him. It is usually more important to be able to get service when needed than it is to have the very best piece of equipment.

Saving Ice

THE CONDITION of the refrigerator box is a big factor in determining the rate of melting of ice. While effective cooling depends on the melting, excess melting is due to poor insulation or air leakage. A common cause of air leakage is worn latches or loose hinges. By removing the catch from the doors and putting a piece of cardboard underneath it the door can be made to shut tightly again. This would result in a saving of food as well as ice.

The old idea of saving ice in the refrigerator box by wrapping it with paper is all wrong. It may be a good way to protect the ice and prevent it from melting, but the ice would have no cooling effect unless it is allowed to melt. The best way to save ice is to provide a well insulated box with tight fitting doors.

"Mr. Jiggers," asked the professor in the freshman class, "what three words are used most among college students?"

"I don't know," said the student.

"Correct," replied the professor.

Profitable Poultry

By Ralston R. Hannas

Troubles of the Oviduct

JUST at this season, there are doubtless many troubles with the egg organs of the hens. We spoke of prolapsus last month. In this disease bloody tissue projects from the vent. This must be gently pushed in again and vaseline applied, at the same time cutting down on the meat scrap in the ration and giving plenty of green food.

There may be a number of soft shelled eggs. If there is plenty of oyster shell available for the hens, and if the birds are allowed out in the sunshine, there should not be any trouble in this direction. Neither should there be any trouble of this kind even though they are not allowed out in the sunshine as long as they are getting two pounds of cod liver oil in each 100 pounds of laying mash. If soft shelled eggs appear in spite of this, the trouble is very likely that the hens are too fat. This excess fat crowds the oviduct, through which the egg passes in the process of manufacture, so that the muscles in this duct cannot act properly, and the egg passes through so rapidly that there is not time enough for adding the shell. Watch the feeding and cut down on the amount of grain fed, if the birds are too fat. Eight pounds per 100 birds per day is plenty. Let them get the rest of their feed from the laying mash that is kept before them all the time in hoppers.

Blood spots in eggs are quite common and are by no means the sign of a rotten egg. If the blood is diffused throughout the whole egg, this egg, of course, is no good for eating, but if the blood is clotted and appears on the edge of the yolk, these spots may be removed, and the rest of the egg is perfectly good for eating. The cause of these spots is the rupture of small blood vessels in the oviduct of the hen, and these clots of blood are included in the egg. The ruptures may be due to the weakened condition of the individual hen, continued high production, or forcing or high protein content feeds. If there are only a few such cases, they may be traced to one or two individuals, but if there are many, they are undoubtedly due to the way the flock is being fed. Cut the amount of meat scrap way down, even cut it in half, and see that the birds get plenty of green food.

Eggs with watery white are also a common summer trouble. Lack of green food and faulty management are the cause of these, in large measure, although it may be due to some individual condition. Careful management of the flock, as stated above, however, will help considerably in preventing these watery whites.

June Hatched Chicks

CHICKS that are hatched in June are not considered by most people to have as good a chance of maturing into first-class pullets at a respectable date as are those of earlier hatches. It is quite true that in many sections of the country, especially in those sections in which there is an early summer, June chicks are at a disadvantage because the hot weather strikes them at a bad time and gives them a setback that is difficult to overcome.

On the other hand, there are sections of the country, such as the northern states, where the summers are not so early or so hot, and June chicks thrive well. Even in some of the states where the summer is earlier, June chicks frequently do well because of a luxuriant growth of green food and plenty of shade. In fact, many breeders who are raising birds for the winter shows prefer to have these birds hatched in June.

If, therefore, any chicks are hatched in June, particular attention must be paid to giving them a range containing a luxuriant growth of greens and plenty of shade, especially around the houses. The houses must be well ventilated at night also. Clean, fresh water, set in the shade where it will keep cool, must be on hand at all times. The ration must be such as to produce steady growth throughout the summer. The same kind of a ration that is fed to chicks of other hatches will be all right for these chicks.

Quality in Eggs

SUMMERTIME is the hardest time of the year for farm eggs, and the eggs produced for the next three months are usually of the poorest quality of any produced during the year. This need not be the case if proper care is taken in the production and handling on the farms.

A high quality egg is one that is of good size, that is, weighs at least two ounces, has a clean shell, is fresh, and contains no growth of any kind. Such eggs can be produced on farms in the summer as well as in any other season. Some of the simple steps in producing such eggs are: provide clean nests and plenty of them, with clean shavings or other nesting material in them; gather the eggs once a day and keep them in the coolest place available; market them at least once a week and preferably twice a week, keeping all small and dirty eggs for home use; keep males out of the laying flock so there will be no fertile eggs, as fertile eggs do not keep so well as infertile eggs; sell only eggs of which the age is known—do not sell eggs that are taken from stolen nests, as the age of these eggs is not known, neither is the quality, and there may be some germ development within them. If it is possible to candle these eggs, and they show up clear, they are all right for home consumption, for they will probably be too dirty to market. It is not a good plan to wash eggs, as their protective covering is removed in the process and they are likely to spoil or be considerably lowered in quality when they reach the market.

Controlling Coccidiosis

A DISEASE known as coccidiosis is one of the worst pests of the poultry keeper at this time of the year. It affects chicks at from four to eight weeks of age, causing them to be droopy, remain close to the hover, and stand with heads drawn in; they appear sleepy. It is a hard disease to fight, as the spores remain in the soil from one year to the next.

Feeding plenty of milk has been found to control outbreaks of this disease, along with proper sanitary methods. The University of California worked out this method of control and recommends the following ration: dry skim milk, 40 pounds; wheat bran, 10 pounds; yellow cornmeal, 30 pounds; and ground barley, 20 pounds. Any form of milk can be used, *provided enough milk is consumed.* Start feeding this mash as soon as the presence of the disease is suspected, and provide plenty of hopper space so all the chicks will get the benefit of the milk mash. The milk keeps the contents of the intestinal tract acid and makes an unfavorable condition for the growth of the disease germs; it also stimulates rapid growth in the chicks, giving them increased resistance against the disease.

Sanitary conditions must also be provided along with the feeding of milk. Scrubbing the brooder house, before the chicks are put into it, with a hot lye solution of one pound of lye to 40 gallons of water, and spraying the walls and fixtures with a five per cent solution of a good disinfectant, will help to kill the spores of the disease. Also, let the yard lie idle for a year with frequent cultivation so the top layer of soil will have a chance to be exposed to the sun and dry out. Raise the young stock on fresh ground where it is possible to do so. Also, keep the young stock separate from the old stock for best results.

Watch Out for Rose Bugs

DURING the month of June and the early part of July, bugs known as rose bugs or rose chafers cause a number of deaths among partly grown chicks. Chicks from two to 10 weeks old are the most commonly affected. They seem to like these bugs, for they eat lots of them. Unfortunately, these bugs are poisonous to the chicks, for they cause the youngsters to act listless and sleepy, and death finally results. If the crops are cut open, large numbers of the rose bugs will be found in them.

There are two methods of controlling this situation. One is to confine the young stock to yards that are free from flowering shrubs, grapevines, daisies and tall grass. The other is to hatch the chicks early so they are more than 10 weeks old at this season, for the older ones are not affected. These rose chafers, of course, are more prevalent in some sections than in others.

Handling the Orchard Soil

(*Continued from page 20*)

suggestions that potash is beneficial, particularly with the peach.

Divided or split applications of fertilizers have as yet shown no particular advantage over single applications, although a final statement on this matter cannot yet be made.

Fall applications of fertilizer are being used in the arid regions and have given quite satisfactory responses in some eastern sections, but their regular use in the East has not been adopted.

Applications of lime to fruit trees have shown no beneficial results directly to the trees, but are often beneficial in establishing the orchard cover or to the intercrops.

Fruit-Tree Improvement Now Includes Root Selection

ALTHOUGH the ordinary fruit tree is an "assembled article" in which the part under ground is generally grown from seed and the part above ground is the result of grafting a bud on the seedling rootstock, horticulturists in the past have confined their improvement efforts to the part of the tree above ground. Recently, however, the United States Department of Agriculture has undertaken to bring about further improvement by developing a method of producing better rootstocks, or underground parts, on which to graft or bud the desired varieties.

It is well known by nurserymen and orchardists that most fruits do not reproduce varieties from seed; that budding or some other form of vegetative propagation must therefore be used to multiply a given variety. It is not so well recognized, however, that seedling rootstocks also vary in their hereditary make-up. The practice of producing most rootstocks from seed is probably responsible for much of the irregularity in their performance and the ultimate failure of many orchard trees.

Guy E. Yerkes, horticulturist in the Bureau of Plant Industry of the department, has conducted enough tests to show that some rootstocks can be propagated by means of root cuttings and in this way faithfully reproduce the mother root system. The mother trees selected have shown exceptional vigor and indications of resistance to insects and diseases. The vegetative propagations from these mother trees are being tested to determine their affinity for the varieties worked on them and their adaptability to a wide range of conditions by planting in orchards. Several apple, cherry and plum selections already made are showing superiority over seedling stocks in the nursery. By propagating them vegetatively—by means of cuttings or layers rather than by seed—the characteristics of the mother plant are assured in the progeny. Inexpensive and rapid propagation of the selected and proved individuals is an important problem. Much of the difficulty experienced at first in that connection has been overcome and methods have been developed which promise commercial application of this means of improving the underground part of fruit trees. Several years' tests under orchard conditions will be necessary to bring out the qualities of these selected stocks before introducing them.

THE COMMISSIONER of Agriculture of Massachusetts, Dr. A. W. Gilbert, has declared the cultivated black currant a public nuisance. The order which outlaws the black currant became effective April 1 and states that "it shall be unlawful for any person to possess, propagate, sell or offer for sale these plants in the state of Massachussetts." The action was taken to strengthen the blister rust control program that is under way in the state.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912,

of American Fruit Grower Magazine, published monthly at Chicago, for Apr. 1, 1927.

State of Illinois, County of Cook, ss.—Before me, a notary public in and for the state and county aforesaid, personally appeared Harry W. Walker, who, having been duly sworn according to law, deposes and says that he is the business manager of the American Fruit Grower Magazine, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:

Publisher—Magazines, Inc., 53 W. Jackson Blvd., Chicago, Ill.

Editor—None.

Managing Editor—C. E. Durst, 53 W. Jackson Blvd., Chicago, Ill.

Business Manager—Harry W. Walker, 53 W. Jackson Blvd., Chicago, Ill.

2. That the owner is: (If the publication is owned by an individual his name and address, or if owned by more than one individual the name and address of each, should be given below; if the publication is owned by a corporation the name of the corporation and the names and addresses of the stockholders owning or holding 1 per cent or more of the total amount of stock should be given.)—C. A. Tupper, L. A. Sisley, H. W. Walker, J. E. Montgomery (all at 53 W. Jackson Blvd., Chicago, Ill.); C. W. Price, Suite 601, 250 Park Ave., New York City; E. G. K. Meister, 501 The Arcade, Cleveland, O.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.)—None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect, in the said stock, bonds or other securities than as so stated by him.

HARRY W. WALKER.
Business Manager.

Sworn to and subscribed before me this 22nd day of March, 1927.

(Seal) A. C. BAMBERGER.
Notary Public.

(My commission expires Aug. 11, 1929.)

Clean, bright, glistening fruit is attractive to everybody. Many fruits, particularly apples, pears and peaches are cleaned best with Andy Moe.

Clean Fruit Pays!

Andy Moe Fruit Cleaners enable growers to produce cleaner, brighter fruit, a better pack, more top grades, better prices

HERE'S a practical fruit cleaner that really cleans—quickly and economically. Growers everywhere now know that the thorough and careful cleaning of fruit raises grades and helps bring top prices. Andy Moe equipment accomplishes this speedily and with substantial savings in labor costs. Users report that labor savings alone have paid for their Andy Moe Cleaners in a single year.

Andy Moe Fruit Cleaners are standard equipment in the fruit packing industry. Many of the largest fruit packing plants on the Pacific Coast use Andy Moe equipment. Hundreds of machines are now in use by enthusiastic owners.

Many have written letters telling of success with Andy Moe Cleaners. Read what some of them say:

Will continue to clean their fruit

"We have your fruit cleaners installed and are very well satisfied with the work they have done this season. In fact, we are so well satisfied that we are going to use them another season whether the government restrictions are removed or not."—J. C. PALUMBO FRUIT CO., Payette, Idaho.

Best on the market

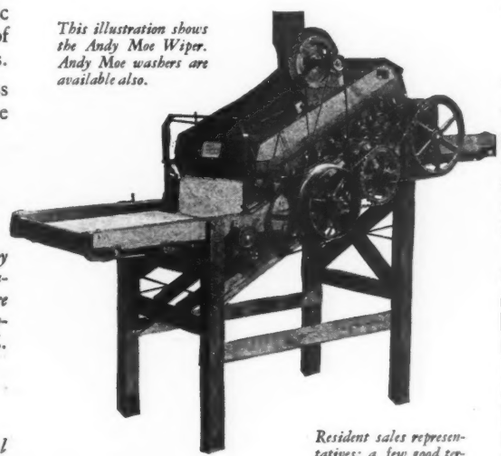
"We have used the Moe Fruit Cleaners for several years with good results. The operating costs are small compared with results. We highly recommend Andy Moe Fruit Cleaners as being the best on the market." — CAMPBELL ORCHARDS COMPANY, Wapato, Washington.

Fruit well cleaned

"The Andy Moe Cleaners did good work for us. Every car of apples we have had sampled and analyzed by the State Department of Agriculture showed less than half the maximum quantity of arsenic allowed."—TUOLUMNE APPLE GROWERS ASSOCIATION, Soulsbyville, California.

Clear bill of health

"We have packed more than 200,000 boxes of pears and apples this season and have found the Moe wiping machines very satisfactory in cleaning off spray residue from the fruit. We have experienced no trouble whatever in receiving a clear bill of health from the government inspectors."—STUBBS FRUIT AND STORAGE COMPANY, Yakima, Washington



This illustration shows the Andy Moe Wiper. Andy Moe washers are available also.

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Tell us what your 1927 crop will be and we will tell you how to do your cleaning more quickly and economically. Whether you wash or wipe your fruit we have machines which exactly meet your requirements. Simply fill out and mail the coupon below or write for information.

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July, 1927
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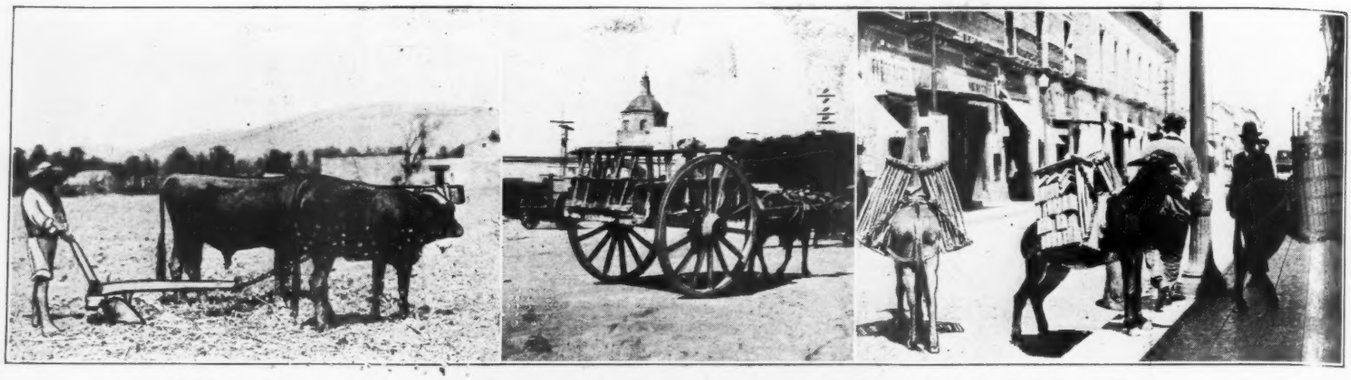
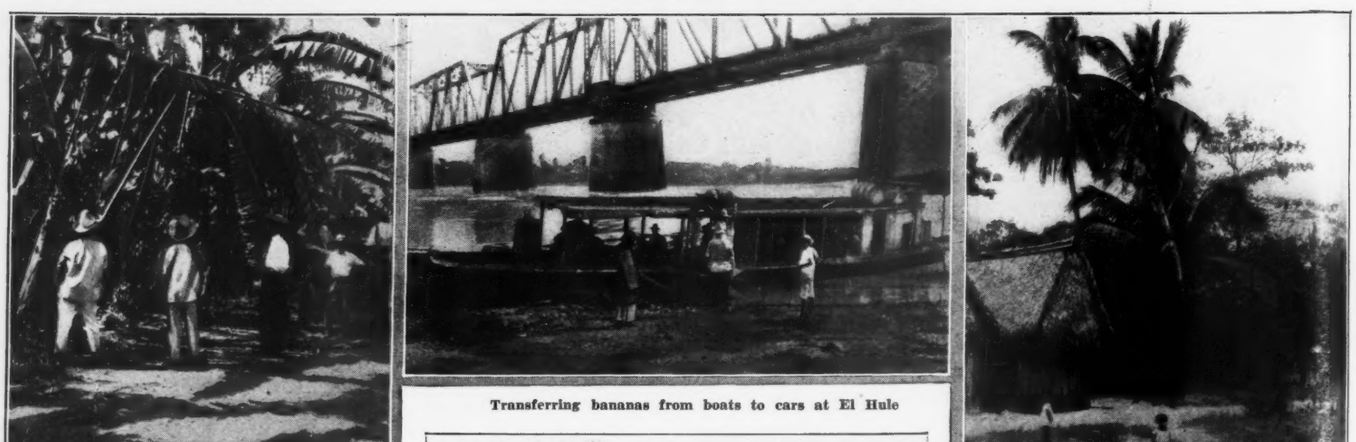
South of the Rio Grande

(*Article on Page 5*)



Yoked oxen and a one-handled wooden plow with steel point. Type of cart in common use. Burros carrying bricks in Aguascalientes

Pumping water for irrigating strawberries. Inside a banana plantation. A market garden near Jalapa in the state of Veracruz



Transferring bananas from boats to cars at El Hule

Above.—Cutting bananas. The bunches are cut when the fruit has reached sufficient size and while still green. The pole held by the native at the left has a chisel-like knife about three inches wide at its end. The man jabs this about half way through the fibrous stalk which, with the weight of the bananas, immediately begins to bend over. The knife is quickly withdrawn and the pole is then braced against the stalk above the cut to assist in lowering the bunch of bananas carefully. A second native stands ready to catch the bunch in his hands, after which it is cut from the stalk and properly trimmed

Above.—Cocoanut palms at Tuxtepee, which is about 18 degrees north of the equator

Left.—John Cunningham of the Wisconsin Agriculturist examining a henneguin plant at El Manuel. Sisal and binder twine are made from the fiber of this plant